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ABSTRACT

This packet of materials for a class on medical terminology consists of a collection of stories with highlighted vocabulary, teacher's guide, and student's guide. The materials teach medical terms in a series of stories about a woman named Mary Consola. Each story begins with a list of word parts that will be learned; after the story, new word combinations are listed. A glossary is provided. The teacher's guide discusses the three components of each lesson in the core curriculum: before, during, and after reading activities. Teaching strategies are suggested, and additional review activities are described. The student's guide consists of reproducible informational sheets and activities. An introduction discusses language changes, a short history of the English language, a short history of medical language, and vocabulary building through learning word parts. Reproducible activities are then presented for 13 lessons. Pre/posttests are also provided. (YLB)

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MARY'S STORY: A CURRICULUM FOR TEACHING MEDICAL TERMINOLOGY

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Introduction

This class will help you learn to use medical terms. The terms will all be used in stories about a woman named Mary Consola. Mary's husband, Mike, had been out of work for a long time. It was very hard for Mary, Mike, and their son Billy to make ends meet.

But Mike found a job and he, Mary, and Billy had to move to a new town. Mary's mother lived with them. You will follow Mary to her new apartment, through school, and into a new job. Along the way you will meet new people, especially Thelma, Mary's new neighbor.

We hope you enjoy Mary's stories and hope they help you learn your medical terms.

1. Mary Moves In

In this story you will learn about these word parts:

arthr/o
tonsill/o
gastr/o
itis

Mary looked around her new apartment and felt better than she had in a long time. Her husband, Mike, had a job. Billy, her six-year-old son, was happy in his new school. Her mother moved with them. Mary just had to get used to life in a brand new town.

Her mother's **arthritis** was bothering her, so Mary had to find a good doctor who could help her. Mike had **gastritis** before they moved, but it wasn't bothering him right now.

Billy had just had **tonsillitis**. He had been very sick, but he was better now. But Billy needed to have a check-up by a children's doctor.

Here are the combinations:

arthritis—(joint + inflammation) inflammation of joint
gastritis—(stomach + inflammation) inflammation of stomach
tonsillitis—(tonsills + inflammation) inflammation of tonsills

2. Meeting a New Neighbor

In this story you will learn these word parts:

andr/o
cardi/o
dent/i
dermat/o
gynec/o
hemat/o
iatr/o and **ian/o**
ist
logist
nephr/o
neur/o
onc/o
ophthalm/o
path/o
ped/o
psych/o

Mary finally had her apartment organized. She still had to get used to the new town. She went outside to get her mail. Along the way, Mary ran into another woman who was in a nurse's uniform.

"Hi," said Mary. "I just moved in. My name is Mary Consola."

"Hi," the woman answered. "I'm Thelma Jones. I live in the apartment right next to you. Welcome."

"Are you a nurse?" asked Mary.

Thelma smiled. "Yes, I'm an LPN. I just started about three months ago. The training was hard work, but worth it. I love my job."

Mary had a great idea. "Maybe you can help me. I need to find new doctors. You probably know all the doctors in this town."

"What kind of doctor do you need?" Thelma asked.

"I'm not sure. I don't know the medical titles the doctors use," Mary replied.

"Well, let's get the telephone book and look in the Yellow Pages. I'll help you."

They looked in the Yellow Pages under physicians.

Mary frowned. "See, what I mean. These words are so long. I have no idea what they mean. Look at this—**cardiologist**. What's that?"

Thelma answered, "It is really easier than it looks. Most medical words are made of word parts. If you know what the word parts mean, you can figure out what the words mean. Look at the word parts in **cardiologist**. **Cardi/o** means something to do with the heart. **Logist** really means one who studies or an expert. So a **cardiologist** is a heart expert—a doctor for the heart. Let's look at the other specialties."

"Here's one I know," Mary said. "A **gynecologist** is a woman's doctor. I know that **logist** means an expert. What does the first part of the word—**gynec/o**— mean?"

"You just said it," laughed Thelma. "It means woman or female. So a **gynecologist** is a doctor for women. By the way, **andr/o** means man."

"Here's one I never saw before—an **oncologist**. What's that?"

"**Onc/o** is the medical word part for a tumor or cancer. So, what do you think an **oncologist** specializes in?"

"I get it. That's a doctor who treats people with cancer," Mary said.

Thelma told Mary that even a simple word like **dentist** is made up of word parts. **Dent/i** means tooth and **ist** means specialist. A **dentist** is a tooth specialist.

Mary and Thelma looked at the rest of the listings. Here is what they saw:

Dermatologist: Thelma said **dermat/o** means skin. So a **dermatolgist** is a doctor who specializes in diseases of the skin.

Hemat/o is the word part for blood. A **hematologist** is a physician specializing in diseases of the blood.

Thelma told Mary that a **neurologist** is a specialist in problems of the nerves or nervous system. So **neur/o** has to do with the nervous system. **Neurologists** do not work with people who are "nervous." They treat people who have something wrong with their nervous system—including the brain, the spinal cord and the nerves.

A **psychologist** is a mind specialist. **Psych/o** is the word part for mind.

The word part **path/o** means disease. A **pathologist** is a specialist who studies diseases in the body.

Mary and Thelma found a doctor who was a **nephrologist.** Thelma said that the word part **nephr/o** has to do with the kidneys. So a **nephrologist** is a kidney specialist.

If Mary needed an eye exam, Thelma said she could go to an **ophthalmologist.** The word part **ophthalm/o** means eyes.

"Here's one that's different," said Mary. "I know what kind of doctor this is, though. It is a **pediatrician**—a children's doctor. I take Billy to a **pediatrician**. But that doesn't have **ologist** in it."

"No, it doesn't, Mary," Thelma said. "**iatr/o** means a physician. **Ped/o** refers to children. So you are right. A **pediatrician** is a doctor for children."

Just then Billy came home from school. Thelma said, "Is it time for the kids to be home from school already? My son, Gregg, is probably wondering where I am. I have to go."

"Goodbye, Thelma. Thanks for being so helpful. I hope I see you again."

"Don't worry, you will," laughed Thelma as she went out the door.

New word combinations:

androgynous—(man + woman) without sexual characteristics of a man or a woman

andropathy—(man + disease) any disease that only men have

cardiologist—(heart + specialist) a physician specializing in the heart

cardionephric—(heart + kidney) having to do with the heart and the kidney

cardioneural—(heart + nerves) having to do with the nervous control of the heart

cardiopathy—(heart + disease) disease of the heart

carditis—(heart + inflammation) inflammation of the heart

dentist—(teeth + specialist) a specialist in the treatment of the teeth

dermatitis—(skin + inflammation) skin inflammation

dermopathy—(skin + disease) disease of the skin

gastrocardiac—(stomach + heart) having to do with stomach and heart

gastrologist—(stomach + specialist) expert in the study of the stomach

gastropathy—(stomach + disease) disease of the stomach

gynecopathy—(woman + disease) diseases peculiar to the female reproductive system

nephritis—(kidney + inflammation) inflammation of the kidney

neuritis—(nerves + inflammation) inflammation of a nerve or nerves

neurocardiac—(nerves + heart) having to do with the nerves supplying the heart

neurogastric—(nerves + stomach) having to do with the nerves of the stomach

neurologist—(nerves + specialist) a physician who specializes in diseases of the nervous system

neuroophthalmology—(nerves + eyes + the study of) the study of the nerves of the eyes

neuropathy—(nerves + disease) diseases of the nervous system

neuropsychopathy—(nerves + the mind + disease) disease of the nerves combined with a mental disorder

oncologist—(cancer or tumor + specialist) a physician who specializes in treatment of tumors or cancer

ophthalmitis—(eye + inflammation) inflammation of the eye

ophthalmoneuritis—(eye + nerve + inflammation) inflammation of the optic nerve (the nerve to the eye)

psychiatrist—(mind + physician) a physician who specializes in mental disorders

psychopathology—(mind + disease + study of) the study of diseases of the mind

tonsillopathy—(tonsils + disease) diseased tonsils

3. An Emergency

In this story you will learn these word parts:

abdomin/o
acute
appendic/o
ectomy
febr/o
gram
meter
pharmac/o
phobia
son/o
therm/o

Two weeks passed quickly after Mary met Thelma. The two women became friends. Mary trusted Thelma and knew she had a friend she could rely on.

Early one morning, just after Mike had gone to work, Billy woke up crying. He said he had a terrible pain in his belly. Mary felt his forehead. He felt very hot—he had a fever. She took his temperature with a **thermometer** (**therm/o** means heat; **meter** is a measuring device). It was 103°! By the time Mary read the **thermometer**, Billy was screaming that his belly hurt. Mary ran to her phone and called Thelma. She came right over, bringing her son, Gregg, with her.

Thelma said that they should take Billy to the emergency room. Mary's mother stayed with Gregg until it was time for school. Mary, Thelma, and Billy went to the emergency room.

Along the way, Thelma tried to comfort Billy and help Mary keep calm. Billy was especially frightened because he was really afraid of doctors. Someone had once told Mary that Billy had a **phobia** (extreme fear) of doctors.

Soon they were in the emergency room and Billy was being examined by the physician. She said that Billy had **acute abdominal** pain and was **febrile.** She ordered a blood test and told Mary that Billy could possibly have **appendicitis.** If he did have **appendicitis**, he would have to have an **appendectomy.**

Mary was very frightened and asked Thelma what that meant. Thelma explained that **acute** meant a disorder that had a sudden start that would not be permanent. **Abdominal** meant in the abdomen or belly. **Febrile** meant the same as fever. Mary knew that **itis** means inflammation. **Appendic/o** refers to the appendix. That is a part of the body found in the lower right side of the abdomen. **Ectomy** means to remove by surgery. If Billy had **appendicitis**, he would have to have an operation to remove his appendix.

A worker came into the room and took some blood from Billy for a blood test. Mary and Thelma waited with Billy for the results. As they waited, Billy began to feel better. His belly still hurt, but he said it felt better. Soon the doctor came back. She said the blood test looked good and she didn't think Billy had **appendicitis**. Just to be sure, she wanted Billy to have another test. She called it a **sonogram**. She explained that **gram** means to record and **sono** means sound. A **sonogram** uses sound waves to look inside the body. It wouldn't hurt Billy at all.

Thelma and Mary took Billy to another part of the hospital where the **sonogram** was done. Then they went back to the emergency room. A nurse took Billy's temperature. It had gone down to 99.9°. Billy was beginning to feel better.

The doctor came back into the room. She said that the **sonogram** showed that everything was normal. Billy probably had a virus. She gave Mary a prescription to take to the **pharmacy** (the word part **pharmac/o** means drugs).

By the next day, Billy was fine. Mary was thankful that he didn't need an operation.

New word combinations:

androphobia—(man + fear) abnormal fear of men

appendectomy—(appendix + surgical removal) surgical removal of the appendix

appendicitis—(appendix + inflammation) inflammation of the appendix

appendicopathy—(appendix + disease) disease of the appendix

arthrectomy—(joint + surgical removal) surgical removal of a joint

cardiogram—(heart + mark) a record of the electrical activity of the heart muscle

cardiophobia—(heart + fear) fear of heart disease

febriphobia—(fever + fear) fear caused by the rise in temperature

gastrectomy—(stomach + surgical removal) surgical removal of stomach

gynephobia—(woman + fear) fear of women

nephrectomy—(kidney + surgical removal) surgical removal of the kidney

neuropharmacology—(nerves + drugs) having to do with drugs that affect the nervous system

ophthalmectomy—(eye + surgical removal) surgical removal of the eye

pathophobia—(disease + fear) abnormal fear of diseases

pharmacist—(drugs + specialist) a druggist

pharmacology—(drugs + study of) study of drugs

pharmacophobia—(drugs + fear) abnormal fear of drugs

psychopharmacology—(mind + drugs + the study of) the study of drugs that affect the mind

thermophobia—(temperature + fear) abnormal fear of heat

tonsillectomy—(tonsils + surgical removal) surgical removal of tonsil

4. Mary Learns New Word Parts

Here are the word parts you will learn in this story:

anti
audio
bi
dis
disks
inter
intra
lingu/o
post
pre
sub
venous
vertebra(e)

In a few days, Billy was feeling just fine again. Mary was grateful that Thelma had helped her when Billy was sick, so she bought a plant for Thelma to say thank you.

Mary took the plant to Thelma's apartment. As soon as Thelma opened the door she noticed something was bothering her new friend. "Mary, something's bothering you. What's wrong?"

Mary looked a little ashamed. "To tell you the truth, Thelma, I feel stupid. If you hadn't been with me last week when I took Billy to the hospital, I would have never known what the doctors and nurses were talking about. You know all those medical words. I don't."

Thelma smiled. "Come in here and sit down. Let's talk about this." The two women went into Thelma's living room and sat down.

"You know, I didn't always know those words. I learned them in LPN training," Thelma explained.

"But I don't think I could ever learn them," Mary said.

Thelma smiled at Mary and said, "I once thought that way about myself, but a friend of mine helped me. She gave me confidence in myself and said I could learn those medical words. She helped me by showing me how to break the words down into the word parts. Once you know some of the word parts, you can usually figure out the whole word."

"Look, Mary," Thelma continued, "You already know some of the word parts. You use them every day. Like this: before you put something into the oven to bake, what do you do?"

"I **pre**heat it," Mary said. "I know that."

Thelma laughed. "See, there's a word part you already know—**pre**. It means before."

"How is that used in a hospital?" Mary asked.

"Well," Thelma answered, "before an operation, a nurse gives a patient **pre**operative care. The word part **post** means after. After the operation you give **post**operative care."

"Here's another word part you know—**inter**. It means between. International means between nations. Here's a big word for you. **Intervertebral disks** are the **disks** between the **vertebrae.**"

Mary held up her hand to stop Thelma. "Hold it! What are **vertebrae**?"

Thelma laughed. "Run your hand down your back. Feel the bone there. That's your backbone or your **spine.** Feel each bump. Each one is a bone called a vertebra. The plural of **vertebra** is **vertebrae**. Your spine or backbone is really your **vertebrae.**"

Thelma went on, "In the hospital the word part **intra** is used a lot. **Intra** means within. Remember in school, when you had sports, but instead of playing teams from other schools, you played teams from within your school? They were called **intra**murals. There are different ways to give injections. You know, shots. **Intramuscular** means within a muscle. **Intravenous** means within a vein.

"Here's another one. What do they sell at an **audio** store?"

Mary answered, "Equipment to play music. You know, tape players, compact disk players, things like that."

"Right. They're all things you listen to. The word part **audio** means hearing. So, what would an **audiologist** be?"

Mary was getting excited. "Let's see...a **logist** is a specialist. **Audio** is hearing. So an **audiologist** is a hearing specialist."

"See, you're getting it. You put the word parts together."

Mary suddenly remembered something she learned in school. "We learned about prefixes in school. Now I understand. **Pre** means before, so prefixes go before the other words. I know one—**anti**. It means against. Like **anti**communist means you are against communism. **Anti**-American means you are against Americans. Are there any medical terms with **anti** in them?"

"Yes," Thelma answered. "**Anti**bacterial is something that kills bacteria. **Anti**-inflammatory stops inflammation."

"Here's another one, Mary. What about **bi**?"

"Well, let me see, a **bi**cycle has two wheels. So **bi** must mean two. Does it?"

Thelma smiled at Mary. "You are really getting it now. **Bi** does mean two. **Bi**focals are glasses with two lenses."

Thelma continued, "The prefix **dis** can mean to be free of or it can mean not. So **dis**agree means not to agree. What do you think **dis**ease means?"

"I guess it would mean to be free of ease or not at ease," Mary answered.

"What about **sub**?" Mary continued. "I know that means below or under. A **sub**marine is under the water. If the temperature is **sub**freezing, I know it's under 32°. Are there any medical terms with the prefix **sub**?" Mary asked.

Thelma said to Mary, "**Subabdominal** means below the abdomen. The medical term for the tongue is **lingu/o**. Some special medicines are taken by placing them under the tongue. Can you figure out what that's called?"

"Well, if **sub** is under, and **lingual** is tongue, I guess under the tongue would be **sublingual**."

"That's right. See, it's not so hard if you learn the word parts."

Here are new combinations:

antiarthritic—(against + joints + inflammation) anything used to relieve arthritis (inflammation of joint)

audiologist—(hearing + specialist) a specialist in hearing disorders

audiometer—(hearing + measure) an instrument used to measure hearing

dentilingual—(tooth + tongue) having to do with the teeth and tongue

disease—pathological condition; "lack of ease"

diskectomy—(disk + surgical removal) surgical removal of an intervertebral disk

diskitis—(disk + inflammation) inflammation of a disk

intra-abdominal—(within + belly) within the abdomen

intrafebrile—(within + fever) during a fever

intragastric—(within + stomach) within the stomach

intravenous—(within + vein) within a vein

ophthalmometer—(eye + measurement) instrument to measure different parts of the eye

postfebrile—(after + fever) after a fever

postneuritic—(after + nerves + inflammation) period of time after neuritis

prevertebral—(before + bone of vertebra) in front of a vertebra

subabdominal—(below + belly) below the abdomen

subdental—(below + tooth) beneath a tooth

subdermal—(below + skin) beneath the skin

subfebrile—(below + fever) low fever

vertebrectomy—(vertebra + surgical removal) removal of a vertebra

5. Mary Reviews What She Has Learned

Mary went home and started to think about what Thelma had taught her about medical words. She thought about all the new words and word parts she had learned in the past few weeks. She went to the desk drawer and took out a notebook and started to write all the words and word parts she had learned.

This is what her notebook looked like:

abdomin/o: the abdomen
acute: illness that came on suddenly and will not last permanently
anti: against
append/o: the appendix
arthr/o: joint
audio: having to do with hearing
bi: two
cardi/o: heart
dent/o: tooth
dermat/o: skin
dis: free of; without
disks: pads between the vertebrae that absorb shock
ectomy: to remove surgically
febr/o: a fever
gastr/o: something to do with the stomach
-gram: a recording or a measurement
gynec/o: woman
hemat/o: blood

iatric/o and ian/o: doctor
inter: between
intra: within
ist: specialist
itis: inflammation
lingu/o: tongue
logist: a specialist
-meter: a measuring instrument
nephr/o: kidney
neur/o: nervous system including the brain
onc/o: tumor or cancer
ophthalm/o: eyes
pharmac/o: having to do with drugs
phobia: extreme fear
post: after
pre: before
psych/o: the mind
son/o: sound
sub: under; below
therm/o: heat
tonsill/o: having to do with the tonsils (tissue in the throat)
venous: having to do with veins
vertebra(e): bones that make up the spine; the backbone

As Mary looked over her notebook, she was surprised at all she had learned. Thelma was right! She could learn medical terms. Mary felt proud of herself. She suddenly felt more confident about what she could accomplish. For the first time in years, Mary began to think about going back to school. She called the local community college and asked them to send her information about classes.

She received a catalog from the community college in a few days. There was one course that really interested her. She wanted to be an LPN like Thelma. Could she do it?

6. Mary Starts School

Here are the word parts you will learn in this story:

hemi
lateral
multi
para
plegia
poly
quadri
semi
tri
uni

Mary was accepted at the community college and started her classes. It would take time, but she was determined to become an LPN. Thelma told her that she would help Mary all she could.

One of Mary's first courses was one on medical terminology or medical words. Mary felt that Thelma had helped her prepare for the course, but she still felt a little nervous. Many of the medical terms used the word parts Thelma had told Mary about.

After her first day of class, Mary went to see Thelma. She showed Thelma the book she was using. Thelma pointed out that many of the word parts she and Mary had talked about were in the book. She also showed her more everyday word parts that are part of medical terms. Thelma and Mary went through the book and picked them out.

"I remember when we talked about the word part **bi** before. It means two. Here are some more words that have something to do with numbers. **Uni** means one. **Tri** means three. A **bi**cycle has two wheels. A **uni**cycle has one wheel. A **tri**cycle has three wheels."

"That's right, Mary. **Lateral** means side. What does **unilateral** mean?"

Mary said, "That's easy. **Unilateral** means one side."

"So, what does it mean if a patient has **unilateral** pain?" asked Thelma.

"Well, that means he or she has pain on one side," answered Mary.

"Good. What about **bilateral** and **trilateral**?"

"Two sides and three sides," answered Mary. "Is there a word part for the number four?" Mary asked.

Thelma replied, "Yes. That is **quad.** If a woman has **quad**ruplets, she has four babies."

"Better her than me," laughed Mary.

"Yes. There is a less happy word with the word part **quad** in it. **Plegia** is the medical term for paralysis (not being able to move or not functioning). **Quadriplegia** is paralysis of all four limbs—both arms and both legs."

"Could different word parts mean the same thing?" Mary asked.

"They could," Thelma answered.

"I thought so. I think **poly** and **multi** mean the same thing. I think they both mean *many.*"

"That's right," Thelma said. "See if you can figure out this long word—**polyneuropathy**."

"That seems like such a long word. Let's see. **Poly** means many. **Neur** means nerves. **Pathy** means disease. So **polyneuropathy** would mean a disease of many nerves. I did it! What about a word with **multi** in it?"

"Well, let's see," Thelma said with a smile. "You're making this hard for me. There is **multilateral**. You know what that means."

"Yes, Thelma, I know. It means many sides. Any other one?"

"Here's one. **Para** means birth. What would **multipara** mean?"

Mary thought for a minute. "I guess **multipara** would mean many births."

"Yes," Thelma said. "It refers to the mother. **Multipara** means a woman has had more than one child, but not necessarily at the same time."

"Here are two more word parts that mean the same thing—**hemi** and **semi**. I think they both mean half. A **hemi**sphere is half of a sphere—half of the globe. **Semi**annual means every half year. Are they used in medical terms?" asked Mary.

"Well, **hemiplegia** means paralysis on one side of the body—half of the body. It would mean, for instance, that a person was paralyzed on the right side, arm and leg. What do you think **hemicardia** means?" Thelma asked Mary.

"You are making me think," Mary laughed. "**Hemi** is half. **Cardia** is heart. **Hemicardia** means there is only half of a heart."

"Good," Thelma said. "Now let me think. A word with **semi** in it. **Semicircular** means a half-circle. The **semi**circular canals are part of the ear that are shaped like half circles."

Here are new combinations:

cardioplegia—(heart + paralysis) paralysis of the heart

gastroplegia—(stomach + paralysis) paralysis of the stomach

hemigastrectomy—(half + stomach + surgical removal) surgical removal of half of the stomach

hemilingual—(half + tongue) affecting or having to do with one half of the tongue

heminephrectomy—(half + kidney + surgical removal) surgical removal of one kidney

hemiplegia—(half + paralysis) paralysis of one side of the body

hemivertebra—(half + vertebra) born with only half of a vertebra

polyarthritis—(many + joint + inflammation) inflammation of more than one joint

polyneuritis—(many + nerve + inflammation) inflammation of more than one nerve

polypathia—(many + diseases) several diseases in one person at one time

polyphobia—(many + fear) excessive fear of many things

polyplegia—(many + paralysis) paralysis of more than one muscle

postpartum—(after + birth) occurring after childbirth (refers to the mother)

thermoplegia—(heat + paralysis) heat stroke

7. More Familiar Word Parts

In this story you will learn these word parts:

dactyl/o
fusion
graph
hydr/a
hyper
hypo
macro
micro
pseud/o
scope
therap/o
trans

Mary and Thelma continued looking at Mary's new text book.

"Here's another familiar word part," said Mary. "**Trans** is part of a lot of words I know—like **trans**port. **Trans** means to pass across or over. **Trans**port means to carry across."

"Right," added Thelma, "The word part **fusion** means to pour. In medicine, a **transfusion** literally means to pour across. In a **transfusion,** blood is passed from one person to another."

"I know the word part **micro** means small. A **micro**computer is a small computer," Mary said.

"That's right. And the word part **scope** means an instrument used to examine visually, you know, to look at something," added Thelma.

"So a **microscope** is an instrument to look at something small. Isn't that right?" asked Mary.

"That's right, Mary. If **micro** means small, what do you think **macro** means?"

Mary wasn't quite sure. "Does it mean large?"

"Right again. You are really learning this. Pretty soon you'll know more than I do," Thelma said with a smile. "Things that can be seen with the naked eye are called **macroscopic**. If they are so small, you cannot see them with the naked eye, they are called **microscopic**. **Micro**surgery is surgery on a very small scale. Surgeons have to use special instruments for that type of surgery. The word part **dactyl** means fingers or toes. So, **macrodactylia** means abnormally large fingers or toes."

"Here's an interesting word part. **Pseudo.** Doesn't that mean false?" asked Mary.

Thelma said, "Yes, it does. A **pseudo**pregnancy is a false pregnancy. A woman thinks she is pregnant, but she isn't."

"That's strange. Here are two word parts that look almost the same—**hypo** and **hyper**."

"Well, they are opposites. **Hypo** means under or too little and **hyper** means above or too much. They used to talk about children who were **hyper**active. They meant children who were too active." Thelma laughed. "Usually they were little boys, like my Gregg, who are just normally active. **Hyper**tension is high blood pressure. **Hypo**tension is low blood pressure."

"I remember talking about the word part **gram** before. That is a record. But here is the word part **graph**. What does that mean?" Mary asked.

"Well, that is the instrument used to record something. An **electrocardiograph** is the instrument used to record the electric impulses given off by the heart. The result or record is called an **electrocardiogram**.

"I know the word part **hydro** means water. How is that used?"

"Let me think. It is used with the word **therapy** which means treatment. **Hydrotherapy** is a treatment with water. Like a whirlpool bath for someone who has been injured. That is **hydrotherapy**."

Mary yawned. "I could use some **hydrotherapy** right now. I am tired. My first day of classes has been tiring. I'm going to say good night.

"I'll see you later, Mary. Good night."

Here are new combinations:

cardiograph—(heart + writing) the device or machine used to record the electrical activity of the heart

cardioscope—(heart + to examine) an instrument to examine the interior of the heart

cardiotherapy—(heart + treatment) treatment of the heart

dactylitis—(finger or toe + inflammation) inflammation of the bones of fingers and/or toes

dermatoscopy—(skin + examination) visual examination of the skin with lens or microscope

dermatotherapy—(skin + treatment) treatment of the skin

gastroscope—(stomach + examine) an instrument to examine the stomach visually

gastroscopy—(stomach + examination) visually examining the stomach

gastrotherapy—(stomach + treatment) treatment of the stomach

hydrophobia—(water + fear) abnormal fear of water

hyperdactylia—(too much + finger or toe) having too many fingers or toes

hyperdontial—(too much+ teeth) having too many teeth

hyperhydration—(too much + water) too much water in the body

hyperthermia—(too much + heat) high fever

hypodactylia—(under; too few + finger or toe) too few fingers or toes

hypodermic—(under; too few + skin) under the skin

hypodontia—(under; too few + teeth) too few teeth

hypothermia—(too little + heat) too low body temperature

macrodontia—(large + teeth) abnormal increase in size of teeth

macrophthalmia—(large + eye) abnormally large eyeball

microcardia—(small + heart) unusually small heart

microdactylia—(small + finger or toe) abnormally small toes and fingers

microdontia—(small + teeth) unusually small teeth

microgastria—(small + stomach) unusually small stomach

oncotherapy—(tumor or cancer + treatment) treatment of tumors

ophthalmoscope—(eye + examine) instrument for examining the inside of the eye

polydactyly—(many + finger or toe) having more than the usual number of fingers or toes

pseudoarthritis—(false + joint + inflammation) a condition that imitates arthritis

submicroscopic—(below + small + to examine) too small to be seen with a microscope

therapist—(treatment + specialist) a person who gives therapy

thermotherapy—(heat + treatment) treatment using heat

tonsilloscopy—(tonsil + examine) looking at tonsils

transdermal—(across + skin) through the skin

8. Places and Directions

In this story you will learn these word parts:

ante
anteri/o
caud/o
cephal/o
deep
dors/o
inferior
lateral
medial
midline
poster/o
superficial
superior
ventr/o

When Mary began studying her medical terminology book, she realized that there are some special terms used to tell direction or places. It confused her at first.

One day when she was talking to Thelma she said, "Why can't they use regular words like top when talking about a person's body?"

Thelma laughed. "It seems like it would make it easier to learn, I know. But the medical terms are more precise and can be used to show direction or place all over the body. Think about this. A person is standing up. What is on top?"

"The head, of course," Mary said.

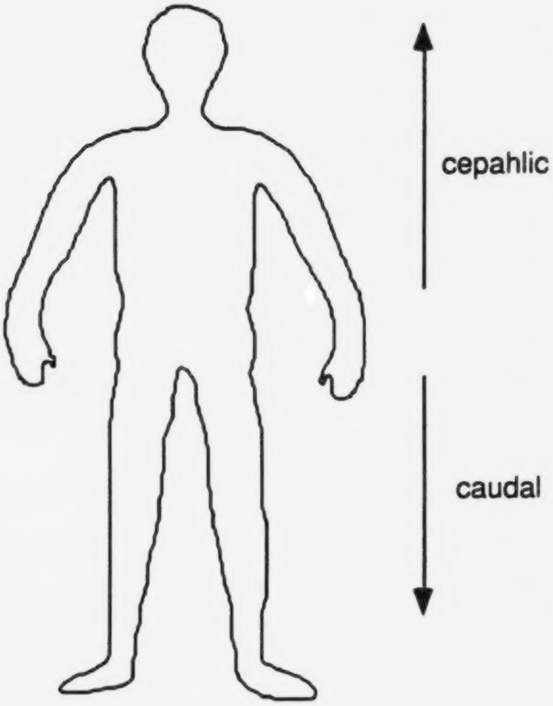
"OK, suppose the person is lying down. Is the head still the top?" Thelma asked.

"Yes...No... I'm not sure," Mary answered.

"That's right. So when we talk about something toward the head in medicine, we don't say 'the top,' we use the term **cephalic**. **Cephalic** really refers to the head. Used with other words, the word part is **cephal/o**. It means the head or toward the head."

"What about the other direction?" Mary asked.

"Well, we sometimes use the word for tail. Of course a person doesn't have a tail, but if we did, it would be at the end of the spine. So toward the tail or end of the spine is **caudal**. When it's put with other words it's **caud/o**." Thelma got a piece of paper and pencil. She drew something and showed it to Mary. "Look at this drawing."



"So **cephalic** is toward the head and **caudal** is toward the tail. I can remember that," Mary said. "What about front and back?"

"Well, there are two ways of looking at that. First, remember when we used the word part **post**?"

Mary thought for a minute. "Yes, I remember, it means after. **Post**operative means after an operation. **Postpartum** means after a woman has a baby."

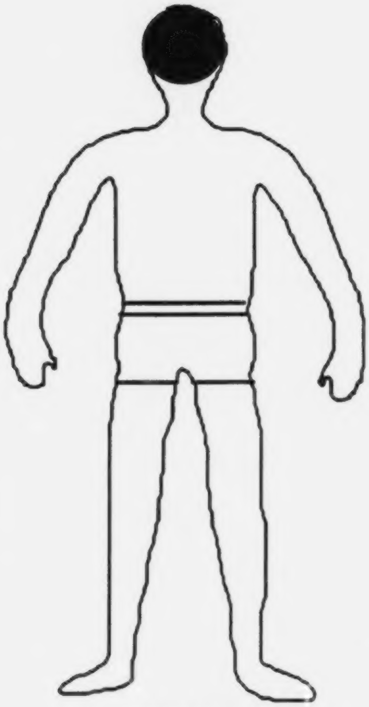
"Good. You remembered," said Thelma. "**Posterior** means located behind—the back side. The word part **ante** means in front of. An **ante**room is a room you go to first. So, if **post** means after, and **posterior** means located behind. What would located in the front be?"

"Let's see. **Ante** means before. **Anterior** would mean located in the front. Right?"

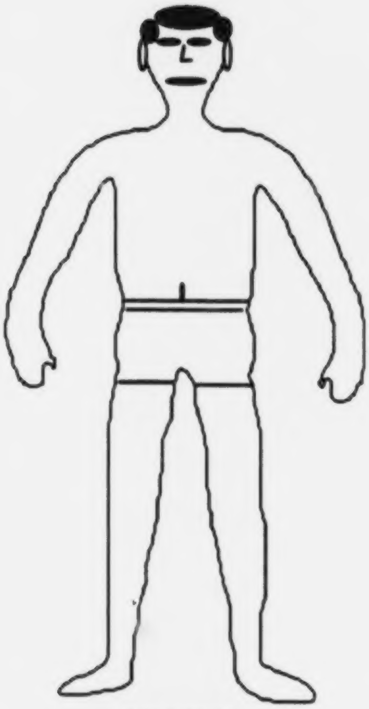
"That's right. You've got it!" Thelma patted Mary on the back.

Thelma continued, "**Dorsal** means near or on the back. It's the same as **posterior**. **Ventral** means on the belly side of a person, so it's the same as **anterior**."

"Let's see," Mary said as she thought. "**Ante** means before. **Anterior** and **Ventral** both mean the front side or belly side of the body. **Post** means after. **Posterior** and **dorsal** both mean the back side of the body or on the back.



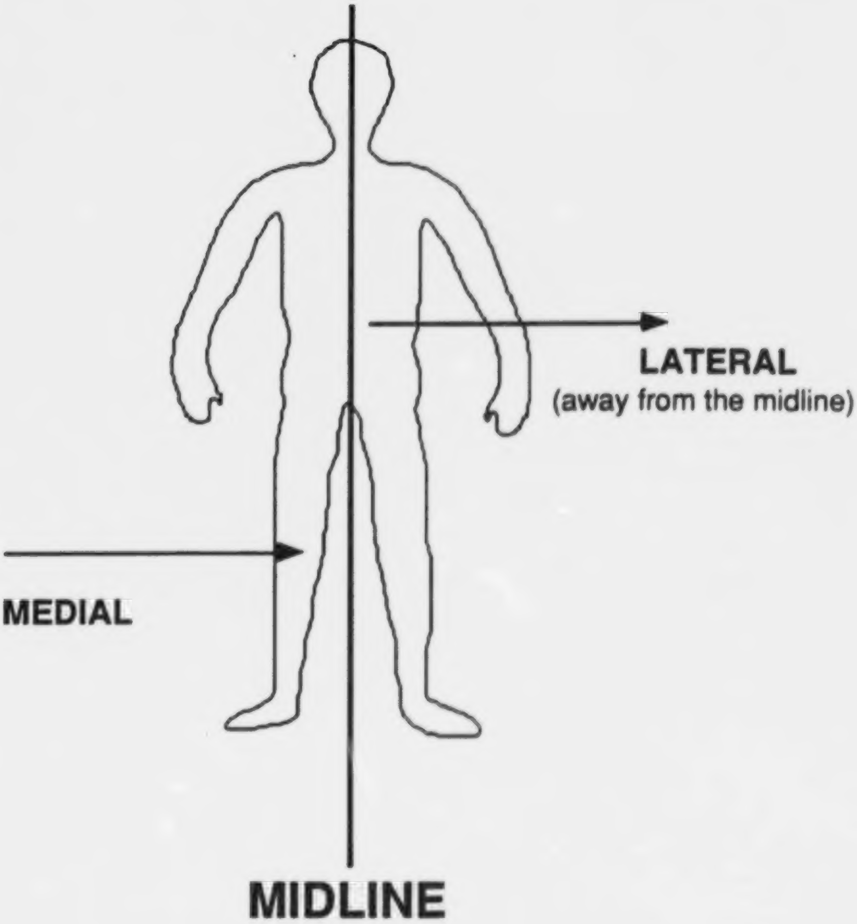
DORSAL
POSTERIOR



VENTRAL
ANTERIOR

Thelma drew another picture for Mary to show the words **dorsal, posterior, ventral,** and **anterior**.

"Now, think of a person standing up. Draw a line down the middle of the person from the top to the bottom. Here, look at this." Thelma took a pencil and paper and drew this:


LATERAL
(away from the midline)
MEDIAL
MIDLINE

"Toward the **midline** is called **medial**. Away from the midline is called **lateral**."

"I remember the word **lateral** from before," said Mary. "It means side."

"Yes, that's a way of thinking about it. As you move **laterally**, you move toward the side," Thelma replied.

"Two other words you might know are **superior** and **inferior**," Thelma said. "Do you know what they mean in medical terminology?"

Mary thought about it for a minute. "Well, **superior** means better and **inferior** means worse. But I suppose that's not what they mean in medicine."

"It's a little different. **Superior** means above or toward the head. **Inferior** means below or away from the head."

"That's easy to remember if you think that something **superior** is above other things and something **inferior** is below other things," Mary thought.

Thelma continued. "Two more words to describe where something is on a body are **deep** and **superficial**. **Deep** is far from the surface of the body. A **deep** cut goes far into the body. **Superficial** means close to the surface of the body. A **superficial** cut does not go far into the body."

"I can remember that," Mary said.

"Those words are all used to tell where on a body something is located. They are really more precise than just saying something is on top or above. You'll see those words all the time in nursing."

Here are new combinations:

antefebrile—(before + fever) before the beginning of a fever

anterolateral—(before + side) in front and on one side

bilateral—(two + sides) two sides

cephalopathy—(head + disease) any disease of the brain or head

cephaloplegia—(head + paralysis) paralysis of the muscles about the head

dorsolateral—(back + side) having to do with the back and the side

dorsoventral—(back + front) having to do with the back and front of the body

hemicephalia—(half + head) born with half of the brain and skull

hydrocephalus—(water + head) increased fluid in the brain

lateroabdominal—(side + belly) having to do with the side of the body and the abdominal area

macrocephaly—(large + head) abnormally large head

microcephaly—(small + head) unusually small head

posteroanterior—(behind + in front) moving from back to front

posteroinferior—(back + below) located back and below

posterolateral—(back + side) located in the back and on the side

posteromedial—(back + middle) located on the back and in the middle

posterosuperior—(behind + above) located on the back and above

subdorsal—(below + back) below the back

superolateral—(above + side) above and to the side

superomedial—(above + middle) above the middle

9. Mary Begins to Learn Body Parts (Nervous System)

In this story you will learn these word parts:

algesi/o
an
asthenia
crani/o
encepahl/o
esthesi/o
meningi/o
myel/o

Soon Mary realized that she would have to learn words and word parts that refer to parts of the body. Thelma explained that some of these word parts would not be familiar to Mary. "But you know, Mary," Thelma said, "you still will be able to learn the word parts and put them together to form new words."

Thelma and Mary began to look at these new word parts. The first chapter in Mary's book was about the **nervous system**.

Thelma explained, "The nervous system includes your brain, your spinal cord, and the nerves in your body. Let's look at some of the words and word parts. Remember a long time ago, we talked about a doctor who specializes in disorders of the nervous system. Remember we said he is a **neurologist**. **Neur/o** has to do with the nervous system."

"Now, let's talk about the nervous system. Let's talk about the brain first. Remember we learned that **cephal/o** refers to the head? Well, **encephal/o** is the brain. Of course, your brain is in your head. It's protected by the skull. The medical term for skull is **crani/o**."

"OK," said Mary. "Let me think about this. We are talking about the nervous system. Your brain, spinal cord, and nerves are in the nervous system. I know from before that **neur/o** refers to the nervous system. I remember that **cephal/o** refers to the head. Now, you say that **encephal/o** refers to the brain. That makes sense. The brain is protected by the skull—the **cranium.** OK, I think I have it so far."

"Good, then let's keep going. There is a membrane around the brain and the spinal cord. It's called the **meninges,**" Thelma continued.

"Wait a minute. Let me make sure I have this right. The **meninges** is the membrane around the brain and spinal cord. I think I have heard of a disease called **meningitis,**" Mary said.

"Right," Thelma answered. "Remember your word parts. What does **itis** mean?"

"An inflammation," Mary replied. "So **meningitis** is an inflammation of the **meninges**."

"Here's another word part—**myel/o**. That refers to the spinal cord. Remember the spinal cord goes from the brain to the lower back. It goes down your spine. Remember the **vertebrae**? They are the bones of your back. They protect the spinal cord the way the **cranium** protects the brain."

"I'm going to see if I can remember what you said so far. The **encephal/o** refers to the brain. The brain is protected by the **cranium**. The **myel/o** refers to the spinal cord. The **meninges** is the membrane covering the spinal cord and the brain."

"That's it," Thelma said. "Now here is some more information. **Algesi/o** or **algia** is a word part meaning pain. The pain can be anywhere. Whenever you see a word with **algia** in it, it means pain someplace. The prefix **an** means no, not, or without. Aspirin is an **analgesic**. What do you think that means?"

Mary was quiet for a minute. "I have to think about this. If **algesi/o** means pain and **an** means without or no, then **analgesic** is something to reduce pain. Aspirin does that."

"Good, you're right," said Thelma. "Now think of this. **Esthesi/o** means feeling. Not feeling sad or happy, but feeling with your body. What do you think **anesthesia** does?"

"Well, **anesthesia** would mean without feeling. I know when you have an operation, you get **anesthesia** so you do don't feel anything during the operation."

"Good," Thelma said. "You know, sometimes medical word parts look alike. The word part **asthenia** is a word part that means weakness. It looks something like **esthesia**, but you know that means feeling."

Mary frowned. "I have to be sure to keep those words straight. **Esthesia** means feeling, so **anesthesia** is without feeling. **Asthenia** means weakness.

Here are new combinations:

abdominalgia—(belly + pain) pain in the belly

algesimeter—(pain + measure) an instrument for measuring sensitivity to pain

analgesia—(without + pain) absence of pain

analgesic—(without + pain) something that relieves pain

anencephalus—(without + brain) a baby born without a brain and spinal cord

anesthesia—(without + sensation) loss of sensation or feeling with or without loss of consciousness

anesthesiologist—(without + sensation + specialist) a physician who specializes in anesthesia

anesthetist—(without + sensation + specialist) a person who gives anesthesia, may be a doctor or a nurse

anhydrous—(without + water) lacking of water

anodontia—(without + teeth) loss of teeth

anophthalmia—(without + eyes) born with one or both eyes missing

antineuralgic—(against + nerve + pain) relieving neuralgia (pain along a nerve)

appendalgia—(appendix + pain) pain in the lower right quadrant or quarter of the abdomen, where the appendix is located

arthralgia—(joint + pain) pain within the joint

asthenometer—(weakness + measure) device to measure strength or weakness

cephalomeningitis—(head + membranes + inflammation) inflammation of the meninges (membranes) around the brain

craniectomy—(skull + removal) opening of the skull and removal of part of it

craniometer—(skull + measure) instrument used for making measurements of the skull

craniospinal—(skull + spine) having to do with the skull and the spine

dermalgia—(skin + pain) pain in the skin

dorsalgia—(back + pain) pain within the back

electroencephalogram—(electric + brain + record) a recording of the electrical activity of the brain

encephalalgia—(brain + pain) pain deep in the head

encephalitis—(brain + inflammation) inflammation of the brain

encephalogram—(brain + record) x-ray showing waves of the brain

encephalomyelitis—(brain + spinal cord + inflammation) an inflammation of the brain and spinal cord

encephalomyeloneuropathy—(brain + spinal cord + nerves + disease) any disease involving the brain, spinal cord, and nervous system

encephalomyelopathy—(brain + spinal cord + disease) any disease involving the brain and the spinal cord

encephalopathy—(brain + disease) any dysfunction of the brain

encephalospinal—(brain + spine) having to do with the brain and the spine

esthesiometer—(feeling + measure) device to measure ability of senses

gastralgia—(stomach + pain) pain in stomach

hemianalgesia—(half + not + feeling) lack of feeling on one side of the body

hemiancephaly—(half + brain) born with only one side of the brain

hyperalgia—(too much + pain) overly sensitive to pain

hyperthermalgesia—(too much + heat + pain) high sensitivity to heat

hypoesthesia—(too little + feeling) decreased sensitivity to pain

intracranial—(within + skull) within the skull

meningitis—(meninges + inflammation) inflammation of the membranes of the brain or spinal cord

meningoencephalomyelitis—(meninges + brain + spinal cord + inflammation) inflammation of the meninges, the brain, and the spinal cord

meningoencephalitis—(meninges + brain + inflammation) inflammation of the brain and its membranes

meningomyelitis—(meninges + spinal cord + inflammation) inflammation of the meninges and the spinal cord

myelalgia—(spinal cord + pain) pain in the spinal cord

myelitis—(spinal cord + inflammation) inflammation of the spinal cord

myeloencephalic—(spinal cord + brain) having to do with the spinal cord and the brain

myelogram—(spinal cord + record) x-ray of the spine after dye has been injected

myeloneuritis—(spinal cord + nerve + inflammation) inflammation of the spinal cord and the nerves

myelopathy—(spinal cord + disease) disease of the spinal cord

nephralgia—(kidney + pain) pain in the kidney

neuralgia—(nerve + pain) pain along the nerve

neurocranium—(nerve + skull) the part of the skull where the brain is enclosed

neuromyelitis—(nerve + spinal cord + inflammation) inflammation of the nerves and the spinal cord

ophthalmalgia—(eye + pain) pain in the eye

polyneuralgia—(many + nerve + pain) pain in several nerves

postanesthetic—(after + not + feeling) time after anesthesia

postencephalitis—(after + brain + inflammation) period of time after encephalitis

pseudesthesia—(false + feeling) a false sensation such as feeling a leg after it has been amputated

subcranial—(below + skull) beneath or below the skull

thermalgesia—(heat + pain) pain caused by heat

thermanesthesia—(heat + not+ feeling) inability to recognize heat and cold

thermesthesia—(heat + feeling) ability to recognize heat and cold

thermesthesiometer—(heat + feeling + measure) device to measure ability to recognize heat and cold

10. Mary Reviews Again

Mary went home and took her notebook out again. Remember, this is what it looked like:

abdomin/o: the abdomen
acute: illness that came on suddenly and will not last permanently
anti: against
append/o: the appendix
arthr/o: joint
audi/o: having to do with hearing
bi: two
cardi/o: heart
dent: tooth
dermat/o: skin
dis: free of; without
disks: pads between the vertebrae that absorb shock
ectomy: to surgically remove
febr/o: a fever
gastr/o: something to do with the stomach
-gram: a recording
gynec/o: woman
hemat/o: blood
-iatr/ian: doctor
inter: between
intra: within
-ist: specialist

itis: inflammation
lingu/o: tongue
logist: a specialist
-meter: a measuring instrument
nephr/o: kidney
neur/o: nervous system including the brain
onc/o: tumor or cancer
ophthalm/o: eyes
pharmac/o: having to do with drugs
phobia: extreme fever
post: after
pre: before
psych/o: the mind
son/o: sound
sub: under; below
therm/o: temperature
tonsill/o: tissue in the throat
venous: having to do with veins
vertebra(e): bones that make up the spine; the backbone

She added this to the notebook:
ante: before
anter/o: front or belly side of the body
caud/o: toward the tail; away from the head
cephal/o: the head; toward the head

deep: away from the surface of the body
dors/o: the back side of the body; on the back
fusion: to pour
hemi: half
inferior: away from the head; below
lateral: side; away from the midline
medial: toward the midline
midline: imaginary line going down the middle of the body
multi: many
para: birth
plegia: paralysis
poly: many
poster/o: back of the body
quadri: four
semi: half
superficial: close to the surface of the body
superior: toward the head; above
tri: three
uni: one
ventr/o: the front or belly side of the body

Mary began to believe that she could learn the medical terminology so she could become an LPN. She knew she still had more terms to learn.

11. Mary Knows More Body Parts

In this story you will learn the following word parts:

hepa/to
hyster/o
mast/o
ot/o
pod/o
pulmon/o
rhin/o

Mary finished her first course at the community college and did very well. She couldn't believe that she actually earned an "A" in the medical terminology. Her new course was anatomy—studying the body, its parts, and structure. She learned where different body parts are and the word parts that are used to represent the parts.

Mary learned that the liver is a very important part of the body. Mary talked to Thelma about what she had learned.

"I know that the word part **hep/a** or **hepat/o** has something to do with the liver. **Hepatitis** is a disease. It means inflammation of the liver.

Thelma laughed. "You know, Mary, I remember when you didn't think you would be able to do this. Now you can teach me the body parts and the words for them. Try this one—what does **pulmon/o** mean?"

"Oh, I know that one, Thelma. It has to do with the lungs. **Pulmon/o** means lungs. So when someone uses the word **pulmonary**, they are talking about the lungs."

"Let's see if I can find a word part you don't know," Thelma said.

"Go right ahead, Thelma," Mary laughed. "I feel up to the challenge."

"OK, Mary, what about the word part **mast/o**?"

"That refers to the breast. A **mastectomy** is the surgical removal of the breast," Mary answered. "OK, now let me challenge you."

Thelma laughed so hard. "Is this the woman who thought she couldn't learn the words? It's good to see you so confident. OK, I'll take the challenge."

"What about the word part **rhin/o**? What does that mean?" Mary asked.

"Well, I guess you don't mean one of those animals with a big horn on his nose, do you? But that gives me a clue. **Rhino** means nose. Am I right?"

"Of course you are, Thelma. So **rhinitis** is an inflammation of the nose. Give me a hard word part now, Thelma."

By this time Mary and Thelma were really laughing.

"It's my turn now," Mary said. "I have a hard one for you. What about **ot/o**?"

"Oh, I have an ear for word parts," Thelma giggled. "It means ear. **Ot/o** is the word part used to mean ear."

"Here's one for you, Mary," Thelma said. "What about **pod/o**?"

"Thelma, you can think of one that's harder than than, can't you? **Pod/o** is the word part used to mean foot.

"OK, Mary. Here's a harder one. What about **hyster/o**?"

"Well, **hyster/o** means uterus or womb. That's the one that makes me angry. Hysterical is from the same word part. They used to think that women became **hysterical** because there was something wrong with their womb. Isn't that silly?"

Mary became serious. "You know, Thelma, I'm sitting here thinking about all I have learned in a few months. Today we talked about the liver (**hepat/o**). I know that **pulmon/o** means lung and **mast/o** means breast. **Rhin/o** is not the animal with the horn on his nose, but means a nose. **Ot/o** refers to the ear and **pod/o** is the foot."

Thelma looked serious for a moment. "You really have changed. You have confidence in what you can do. I feel proud that I helped you reach this place. You will be a very good nurse."

Just then Billy and Gregg ran into the room. "We're hungry, Mom," Gregg said. "What are we having for dinner? Can Billy stay?"

"Well, I guess we can't get too serious around here with these guys," Thelma said to Mary. "Serious conversation is over for now." Thelma turned to Gregg. "We're having spaghetti and meatballs tonight. Yes, Billy can stay. In fact, Mary, why don't you all come to dinner tonight. Mike and my husband can talk about football."

"That sounds great. I love spaghetti and meatballs."

Here are the new combinations:

anhepatia—(without + liver) failure of liver

cardiohepatic—(heart + liver) having to do with the heart and liver

cardiopulmonary—(heart + lung) having to do with the heart and lungs

hemihepatectomy—(half + liver + surgical removal) surgical removal of half of the liver

hepatalgia—(liver + pain) pain in the liver

hepatitis—(liver + inflammation) inflammation of the liver

hepatogastric—(liver + stomach) having to do with the liver and the stomach

hepatologist—(liver + specialist) a specialist in diseases of the liver

hepatonephric—(liver + kidney) having to do with the liver and the kidney

hepatonephritis—(liver + kidney + inflammation) inflammation of the liver and kidneys

hepatopathy—(liver + disease) any disease of the liver

hepatopulmonary—(liver + lung) having to do with the liver and the lungs

hepatotherapy—(liver + treatment) treatment of the liver

hepatectomy—(liver + surgical removal) surgical removal of all or part of the liver

hypohepatia—(too little + liver) decreased functioning of the liver

hysteralgia—(uterus + pain) pain in the uterus

hysterectomy—(uterus + surgical removal) removal of the uterus through surgery

hysteritis—(uterus + inflammation) inflammation of the uterus

hysterometer—(uterus + measure) device for measuring the uterus

hysterogram—(uterus + record) x-ray of the uterus

hysteroscope—(uterus + examine) instrument used to examine the uterus visually

hysteropathy—(uterus + disease) any disease of the uterus

intrahepatic—(within + liver) within the liver

intrapulmonary—(within + lung) within the lungs

macrorhinia—(large + nose) abnormally large nose

mastalgia—(breast + pain) pain in the breast

mastectomy—(breast + surgical removal) the surgical removal of the breast

mastitis—(breast + inflammation) inflammation of the breast

microhepatia—(small + liver) unusually small liver

otitis—(ear + inflammation) inflammation of the ear

otologist—(ear + specialist) a specialist in the study of the ear

otopathy—(ear + disease) a diseased condition of the ear

otoscope—(ear + examine) a device used to examine the ear

podalgia—(foot + pain) pain in the foot

podiatrist—(foot + one who treats) a specialist in the treatment of foot disorders

pulmometer—(lung + measure) a device to measure the capacity of the lungs

pulmonectomy—(lung + surgical removal) surgical removal of all or part of a lung

pulmonitis—(lung + inflammation) inflammation of the lung

rhinalgia—(nose + pain) pain in the nose

rhinesthesia—(nose + feeling) the sense of smell

rhinitis—(nose + inflammation) inflammation in the nose

rhinologist—(nose + specialist) a specialist in diseases of the nose

rhinometer—(nose + measure) an instrument for measuring the nose

rhinopathy—(nose + disease) any nasal disease

rhinoscope—(nose + measure) an instrument used to visually examine the nose

subpulmonary—(below + lung) beneath the lung

12. Mike Hurts His Neck

In this story you will learn these word parts:

burs/o
cervic/o
coccyg/o
genic
lumb/o
my/o
sacr/o
spasm
spin/o
spondyl/o
thorac/o

Mornings later, Mike woke up groaning. "What's wrong?" Mary asked.

"I don't know. My back and neck hurt. I feel so stiff. I guess I pulled a muscle."

"Do you think you should go to work today? Maybe you should just stay home."

"I don't know," Mike said. "There's a lot to do today and I really don't want to risk losing my job. I really like it. Anyway, it's not my turn to drive, so I can just rest in the car along the way."

Mike slowly got out of bed and got ready for work. Mary didn't have any classes that day, so she decided to do some laundry. About 10:00 a.m. the phone rang. It was Mike.

"Mary," he said. "Please come to get me. My neck is so stiff and my back hurts."

When Mary picked Mike up at work, she was worried about him. "I'm going to take you to the hospital to see what is wrong." She expected Mike to say no. When he agreed, she knew that he really hurt.

A doctor examined Mike. She said, "Right now you are having muscle **spasms** in your back. That means the muscles are contracting or tightening.. That can be very painful. I'm going to give you some **antispasmatic** medicine that will control the **spasms**. Have you ever had anything like this before?"

"I once had **bursitis**." Mike answered.

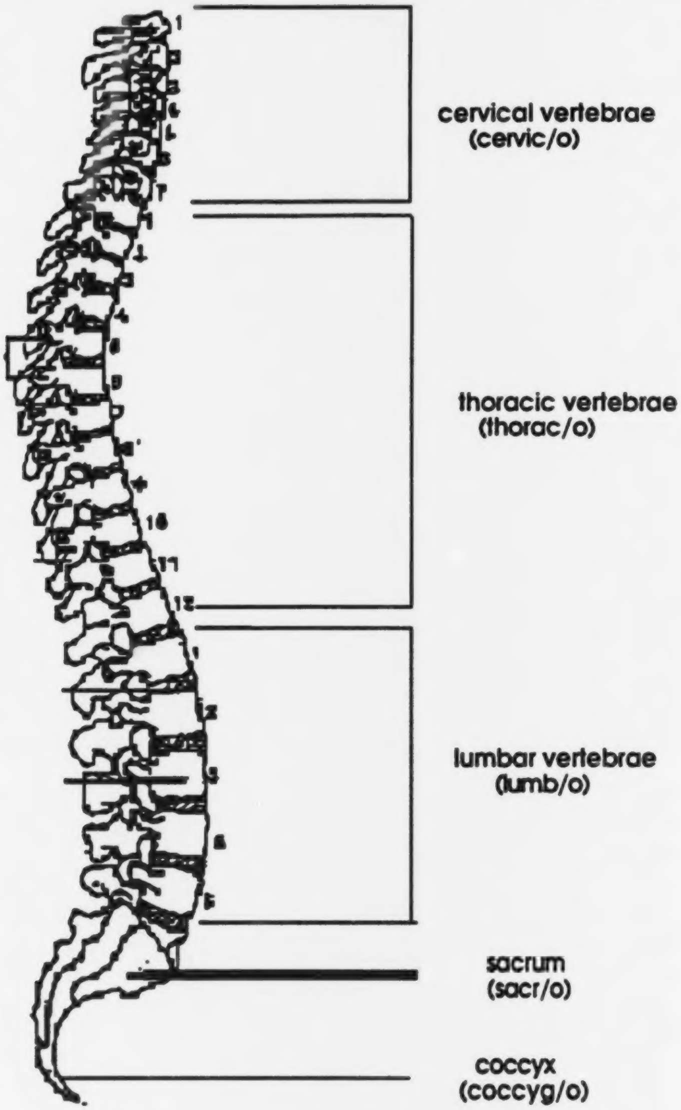
"Well, that's not what's wrong now. **Bursitis** is an inflammation of the **bursa**. A **bursa** is a sack of fluid, usually found between joints. Was your **bursitis** in your shoulder?" the doctor asked.

"Yes, it was," Mike said.

"Well that's pretty common, but you can also get **bursitis** in your knee or elbow. But what you have now is not **bursitis.** Most likely, it is a muscle strain or it could be a sprain. But just to be sure, get those x-rays."

Mike went to get the x-rays. The technician said, "We are going to take x-rays of your **spinal column**—your backbone. Sometimes we only do part of the spine, but your doctor wants to get all sections of the spine."

A week later, Mike and Mary went back to see Dr. Lehman. She showed them this drawing.


1
7
1
2
3
4
5
6
7
8
9
10
11
12
1
2
3
4
5
cervical vertebrae
(cervic/o)
thoracic vertebrae
(thorac/o)
lumbar vertebrae
(lumb/o)
sacrum
(sacr/o)
coccyx
(coccyg/o)

"Look at this, Mr. and Mrs. Consola. This is what the **spinal column** looks like. It is made up of **vertebrae.** The **cervical** vertebrae are those in your neck."

Mary knew that the word part **cervic/o** means neck. It can mean your neck, or the neck of an organ. The neck of the **uterus** is called the **cervix**. It is from the same word part that means neck.

"The next group of vertebrae are near your chest. The chest is the **thorax**, so those are called **thoracic** vertebrae. Next is your lower back. These are called **lumbar** vertebrae, from the word part **lumbo.** Below that is your **sacrum** and last is your **coccyx**. Between each vertebrae is a disk. Sometimes a disk can cause problems. Some people call them slipped disks, but actually they bulge out. You can't completely see disk problems with x-rays, but you can often see some sign of the problem. I don't see anything here to make me think you have a disk problem."

"Well, that's good," Mike said.

"Sometimes you can get a type of arthritis in your vertebrae. It is called **spondylitis**. You might know that **spondyl/o** refers to the vertebrae. Of course **itis** is an inflammation. I don't see that that is the problem either."

"I think you are having a problem with your muscles, not your vertebrae. I think this problem is **myogenic**."

Mike looked at Mary. By his look, Mary knew he wanted to know what the doctor meant. She said to Mike. "**My/o** means muscle. **Genic** means where something starts or comes from. Mike, it's like the beginning—like Genesis in the Bible. So **myogenic** means something that started in the muscles."

"That's right," said Dr. Lehman. "So, I think you need some physical therapy. Let's see if that helps. If you are still having problems in a month after having physical therapy, come back to see me again."

Mike started his physical therapy. They put heat on his sore back and taught him special exercises. Within two weeks he was feeling better. He didn't to go back to Dr. Lehman about his back.

Here are the new word combinations:

bursectomy—(bursa + surgical removal) surgical removal of the bursa

bursitis—(bursa + inflammation) inflammation of the bursa

bursopathy—(bursa + disease) diseased condition of the bursa

cephalothoracic—(head + chest) having to do with the head and chest

cervicetomy—(neck or neck of an organ + surgical removal) the removal of the cervix or neck of the uterus

cervicitis—(neck or neck of an organ + inflammation) inflammation of the neck of the uterus

dorsosacral—(back + sacrum) having to do with the lower back

gastrogenic—(stomach + beginning) originating in the stomach

intralumbar—(within + lumbar) within the lumbar region of the spine

lumbosacral—(lumbar + sacrum) having to do with the lumbar and sacral vertebra

myalgia—(muscle + pain) muscle pain

myasthenia—(muscle + weak) great muscle weakness

myocardia—(muscle + heart) pertaining to the myocardium, the middle layer of the heart wall composed of muscle

myocardiopathy—(muscle + heart + disease) any disease of the middle layer of the heart wall

myocarditis—(muscle + heart + inflammation) an inflammation of the middle layer of the heart wall

myogram—(muscle + record) a record of the movements made by muscle contractions

myometer—(muscle + measure) instrument to measure muscle contractions

myoneural—(muscle + nerve) having to do with the muscles and the nerves

myopathy—(muscle + disease) any disease of a muscle

myositis—(muscle + inflammation) inflammation of a muscle

myosthenometer—(muscle + weak + measure) instrument to measure muscle strength

pathogen—(disease + beginning) substance capable of producing a disease

polymyopathy—(many + muscle + disease) disease that affects several muscles

sacrectomy—(sacrum + surgical removal) removal of part of the sacrum

sacrolumbar—(sacrum + lumbar) having to do with the sacral and the lumbar vertebrae

sacrovertebral—(sacrum + lumbar) having to do with the sacrum and the spinal column

spondylopathy—(vertebra + disease) any disorder of the vertebrae

spondylalgia—(vertebra + pain) pain in the vertebra

spondylarthritis—(vertebra + joint + inflammation) arthritis of the vertebrae

spondylitis—(vertebra + inflammation) inflammation of one or more vertebrae

spondylomalacia—(vertebra + softening) softening of the vertebrae

spondylotherapy—(vertebra + treatment) treatment of the spine

sublumbar—(below + lumbar) beneath the lumbar area

thoracalgia—(chest + pain) pain in the chest wall

thoracolumbar—(chest + lumbar) having to do with the thoracic and lumbar parts of the spine

thoracometer—(chest + measure) an instrument used to measure the expansion of the chest

thoracopathy—(chest + disease) any disease of the chest area

thoracoscope—(chest + examine) instrument used to examine the thoracic cavity visually

13. Mary Moves

In this story you will learn the following word parts:

brady
cost/o
edema
malacia
nat/i
oma
osis
oste/o
plasty
sclerosis
seps/o
tachy
tomy
tox/o
trauma

Two years passed. Mary finished school and became a licensed practical nurse. It seemed like a dream come true. But Mary knew how hard she had worked for that dream. Mike was doing well in his job. He had been promoted to foreman. His boss told him that if he went back to school, he might get more promotions. So Mike started back to school part-time so he could work toward his degree. Billy was doing well in school, too. Thelma and her husband moved to their own home, but Thelma and Mary remained close friends. In fact, Thelma and Mary worked in the same hospital, but on different floors.

Another dream was coming true for Mary. She and Mike bought their own home and they were moving. On a Saturday morning, Mary was cleaning out her desk drawers. In one drawer she found slips of papers with words and word parts on them. She laughed as she remembered using the papers to study for tests in her medical tests. She read each paper and remembered how she learned the words. Here are the papers she found:

brady	slow—**bradycardia** is a slow heart rate

tachy	opposite of brady—means fast; **tachycardia**—fast or rapid heartbeat

edema	a condition where the body or parts of the body retain too much fluid causing swelling
oste/o	bone
oma	a tumor—**osteoma** is a bony tumor found on or near a bone
malacia	softening—**osteomalacia** (bones + softening) means the softening of bones; **encephalomalacia** (brain + softening) is softening of the brain tissue

nat/i	birth—**prenatal** (before + birth) care means medical care while pregnant, before the baby is born
neo	new—**neonatal** (new + birth) means a newly born baby

osis	a condition—**dermatosis** (skin + condition) is a condition of the skin without inflammation (not the same as dermatitis which is an inflammation of the skin)

tomy	making an incision or cut; **craniotomy** is cutting into the skull.

plasty	surgical repair or reconstruction; **rhinoplasty** surgical reconstruction of the nose.
cost/o	ribs—**costalgia** (rib + pain) means pain in the ribs
traumat/o	wound or injury; **traumatopathy** is a disease caused by a wound or injury.
toxic/o	poison; **toxicologist** (poison + specialist) is a specialist in the study of poisons

septic	having to do with organisms that can cause disease; **antiseptic** is something that can kill disease-causing organisms.

sclerosis	hardening

Here are new word combinations:

antiseptic—(against + disease causing organisms) something that kills bacteria and other disease causing organisms

antitoxin—(against + poison) neutralizing a poison

bradycardia—(slow + heart) slow heart beat

cardiomalacia—(heart + softening) softening of the heart muscle

cardiosclerosis—(heart + hardening) hardening of the heart and arteries (**arteriosclerosis**)

costalgia—(rib + pain) pain in the ribs

costectomy—(rib + surgical removal) surgical removal of a rib

craniomalacia—(skull + softening) softening of the bones of the skull

cranioplasty—(skull + form) plastic surgery on the skull

craniosclerosis—(skull + hardening) abnormal hardening of the bones of the skull

craniotomy—(skull + cutting into) cutting through the skull

gastroplasty—(stomach + form) surgical repair of the stomach

hepatoma—(liver + tumor) a tumor of the liver

hypostosis—(too little + bone) lack of development of the bone

intercostal—(between + ribs) between the ribs

meningioma—(meninges + tumor) tumor of the lining of the brain or spinal cord

myelosclerosis—(spinal cord + hardening) hardening of the spinal cord

myomalacia—(muscle + softening) softening of muscle

neonatal—(new + birth) referring to a newly born baby

neuroschlerosis—(nerves + hardening) hardening of the nervous tissue

ostealgia—(bone + pain) pain in a bone

ostecomy—(bone + surgical removal) surgical removal of a bone or part of a bone

osteitis—(bone + inflammation) inflammation of a bone

osteoarthritis—(bone + joint + inflammation) degenerative arthritis

osteodermia—(bone + skin) bony-like skin

osteoma—(bone + tumor) a benign tumor of the bone

otoplasty—(ear + to form) plastic surgery of the ear

ototomy—(ear + cut) cutting into the ear

plastic surgery—(form + surgery) surgery to repair, reconstruct, or restore body parts

podedema—(foot + swelling) retention of fluid in the foot causing swelling

prenatal—(before + birth) before birth

rhinoplasty—(nose + form) plastic surgery of the nose

spondylmalacia—(vertebra + softening) softening of the vertebrae

subcostal—(below + ribs) below the ribs

tachycardia—(fast + heart) a fast heart beat

thoracoplasty—(chest + form) plastic surgery involving the chest and lung

toxic—(poison) having to do with or caused by poison

toxicoderma—(poison + skin) any skin disease caused by poison

toxicodermatitis—(poison + skin + inflammation) any skin inflammation caused by poison

toxicologist—(poison + specialist) a specialist in the field of poisons

toxicopathy—(poison + disease) any disease caused by poisons

toxicophobia—(poison + fear) abnormal fear of being poisoned

toxicotherapy—(poison + treatment) use of poisons to treat a disease

vertebrocostal—(vertebra + rib) having to do with the vertebrae and the ribs

CONCLUSION

Mary stopped in the supermarket one day right after work. She was still wearing her white uniform. While she was putting her groceries into her car a young woman with a baby stopped to talk to her.

"Are you a nurse?" the woman asked.

"Yes," answered Mary. "My name is Mary Consola. I'm an LPN. I work in the hospital across the street."

"My name is Debbie. I would really like to be a nurse," the young woman said.

Mary said, "Well, why don't you start school at the community college. They have an LPN course. That's where I went to school."

The young woman looked down at the ground. "I don't think I could learn everything. All the long medical words—I'd never be able to read them."

Mary smiled. She remembered the time she first met Thelma. "You know, Debbie, I felt that way too. I never thought I could learn those long words. But you can learn them. A friend helped me learn them. I can help you."

Debbie looked up. "Would you do that?" Debbie said.

"Sure! We have to help each other. Someone helped me and I can help someone else. Let's talk about this."

Mary and Debbie continued talking...

Glossary

andro—man

ante—before

anter/o—front or belly side of the body

anti—against

append/o—having to do with the appendix

arthr/o—joint

asthenia—lack of strength

audi/o—hearing

bi—two

brady—slow

burs/o—a sac filled with fluid found between tissues, especially joints

cardi/o—the heart

caud/o—toward the tail; away from the head

cephal/o—the head; toward the head

cervic/o—neck or neck of an organ

coccyg/o—bone at the bottom of the spinal column

cost/o—rib

crani/o—the skull

dactyl/o—finger or toe

deep—away from the surface of the body

dent/i—tooth

dermat/o—skin

dis—to be free from; not

dors/o—the back side of the body; on the back

ectomy—to remove surgically

edema—collection of fluid in the tissues

encephal/o—brain

esthesi/o—feeling

febr/i—fever

fusion—to pour

gastr/o—stomach

genic—the origin

gram—recording

gynec/o—woman; female

hemat/o—blood

hemi—half

hepat/o—liver

hydr/o—water

hyper—above; too much; too many

hypo—below; too few

hyster/o—the uterus; the womb

iatrician—physician

inferior—away from the head; below

inter—between

intra—within

ist—a physician

itis—inflammation

later/o—side; away from the midline

lingu/o—tongue

logist—an expert

lumb/o—part of the back between the thorax and the sacrum

macro—large

malacia—softening

mast/o—breast

medial—toward the midline

mening/o—membrane surrounding the brain and spinal cord

meter—a recording instrument

micro—small

midline—an invisible line which runs down the middle of the body

multi—many

my/o—having to do with muscles

myel/o—spinal cord

natal—birth

nephr/o—kidney

neur/o—the nerves

oma—tumor

onc/o—tumor or cancer

ophthalm/o—the eyes

osis—condition

oste/o—bone

ot/o—ear

para—birth

path/o—disease

ped/o—child; children

pharmac/o—drugs, medicines

phobia—abnormally strong fear

plasty—surgery to repair or reconstruct

plegia—paralysis

pod/o—foot

poly—many

post—after

poster/o—back of the body

pre—before

pseud/o—false

psych/o—the mind

pulmon/o—lung

quadr/i—four

rhin/o—nose

sacr/o—part of the back between the lumbar area and the coccyx

scope—instrument used to examine

scopy—to examine visually

semi—half

septic—disease causing organisms

sono—sound

spasm—contraction or tightening

spinal column—the backbone

spondyl/o—having to do with the vertebrae

sub—under

superficial—close to the surface of the body

superior—toward the head; above

tachy—fast

therapy—treatment

therm/o—heat

thorac/o—the chest area; thorax

-tomy— cutting into

tonsill/o—tonsil (tissues found in the throat)

toxic/o—poison

trans—across

trauma—wound or injury

tri—three

uni—one

venous—vein

ventr/o—the front or belly side of the body

vertebra(e)—bones that make up the spine or backbone

Teacher's Guide

CORE CURRICULUM—TEACHER'S GUIDE

The core curriculum consists of a series of stories that present medical words and word parts in an enjoyable, story-like format. Students will enjoy following the two main characters, Mary and Thelma, as they form a friendship based on Mary's curiosity about Thelma's LPN career. At the same time, students will be able to practice and apply the structural analysis strategy as they learn new words and word parts in a way that is nonthreatening and fun. Students will discover that it can be fun to learn words that once appeared intimidating.

The stories, however, are just one part of the core curriculum. The core curriculum requires active involvement on the part of the teacher as well as the learner. This manual will provide teacher-based and learner-based activities to supplement the curriculum. No curriculum should ever stand alone; successful use of a curriculum is always the result of a delicate balance of teacher and learner involvement.

Each lesson in the core curriculum consists of three components:

- before reading activities;
- while reading activities;
- after reading activities.

It is important to provide guidance, as needed, during all three components. This manual will give suggestions for ways to do this. Part one contains both teacher- and learner-based ideas and activities for before, during, and after reading. Part two provides reproducible activities to be used with specific lessons in the core curriculum. These are intended as preliminary exercises and teachers are encouraged to develop further the activities in a similar manner.

Students respond positively when they are given the opportunity to work cooperatively. Working cooperatively helps to develop the interpersonal and communication skills that are so critical in the health care profession. Try to provide many opportunities for learners to work in different group patterns. For instance, students can work in pairs and read aloud to each other, or develop exercises for each other; students can work in small groups with each group assigned several word parts to teach in some creative way to the other group; or students can work in small groups developing lessons they can present to the whole group.

Modeling of appropriate behaviors is an important responsibility of the teacher. Some important behaviors to model include:

- use of structural analysis strategy;
- enthusiasm for learning new words and word parts;
- communication skills;
- use of self-monitoring techniques while reading;
- visualization as a tool for learning word parts and words.

It is also important to provide guidance with word parts that are similar. For example: **myo** (muscle) and **myel/o** (spinal cord), **asthenia** (lack of strength) and **esthesi/o** (feeling; sensation), and **cephal/o** (head) and **encephal/o** (brain) might be confusing for some students.

The core curriculum covers 115 word parts so students are exposed to many different word parts. Realistically, however, students may not encounter all of them in their studies or on the job. Talk with students about realistic expectations for encountering all of the words and word parts that are covered in the curriculum.

Review Lessons

Lessons five and ten of the reproducible activities section are review lessons. Each lesson has practice exercises that will develop the students' communication skills. In addition to these exercises, the following activities can also be adapted for your students:

- Divide students into groups of three to four. Each group should have five different word parts. Have students, as a group, come up with creative ways to teach the word parts to other groups. For instance, students might use visual aids, drama or role playing, or cartoons. Encourage creativity and game playing to make the exercise more active and fun.

- Have a race with the entire group. Say aloud the meaning of a word that can be made from word parts. Students should use their word part notecards and paper clips to form the word and hold the cards up in the air to signal that they have found it.

- For spelling practice, dictate words or word parts to the students. Or, write misspelled words on the board and have students spot the incorrect letters (Ex. anasthesiolojist). Or, write parts of words or word parts on the board and have students supply the missing letters. Ex: ca_ _i/o (heart), _entra_ (front)

- Make crossword puzzles or word searches for words and word parts. Have students make them for each other.

Part One: Working with the Core Curriculum

A comprehensive approach to teaching requires that students and teachers engage in activities before, during, and after instruction. This approach takes into account recent research in the fields of cognitive psychology and reading. Each phase provides the student with appropriate activities to accomplish the following:

- before—to activate prior knowledge (or schemata), increase motivation, provide a reason for reading, help students predict content;
- during—promote use of strategies and self-monitoring techniques;
- after—model strategies, provide opportunities for practice and application as well as for maintenance of what has already been learned.

Review this section before beginning each chapter.

Before Reading:

- Pronounce new word parts and new words while students read over them. A medical dictionary will help with the pronounciation of unfamiliar terms. Help students predict what they think the words and word parts might mean.

- Point out any potentially confusing word parts, such as *myo* and *myelo.*
- Review strategy (first couple of lessons).
- Review previously learned word parts. Be creative in the ways you review.
- Encourage students to notice Mary's personal growth as the stories progress. For example, Mary has many insecurities about her abilities as the stories begin; as the stories progress, however, she becomes more confident and her self-esteem grows as she meets new challenges.

During Reading:

- Be available to provide guidance, as needed, to answer questions, etc.
- Encourage self-monitoring techniques.
- Encourage visualization to help learn and remember words.

After Reading:

- Discuss the new words and word parts.
- Encourage students to articulate any problems they may be having.
- Have students do word cards for new word parts.
- Have students record new word parts in their notebooks.
- Use the Supplementary Exercises in Part Two of this manual.

Student's Guide
Reproducible Activities

STUDENT'S GUIDE

Introduction

Part One

You will begin your career in the health care field soon. You will see and hear many new words. You may hear doctors, nurses, or other people using words you haven't heard before. You might see new words on charts, bulletin boards, reading materials, or other places. You will have to read and understand these new words to do well on the job.

This program will help build your medical vocabulary. You will learn an important strategy for figuring out new words. You will find that you already know many medical words. The words you already know will help you figure out new words.

First, think about what you do now when you see or hear unfamiliar words. Write about some of the things you do to help you figure out new words.

OUR GROWING LANGUAGE

Most people are unaware of how much the English language changes in their lifetime. But it does change. New words come into use, others are going out of style, and old words take on new meanings. The English language has been changing constantly since it first developed around 400-600 AD. This lesson will explore some of the reasons why language changes.

Think back to when you were a child. Then slowly begin to trace forward. Try to remember when you first heard words that are now familiar to you. Here are some words you probably didn't hear during childhood: **microwave, digital, VCR, Ninja Turtles**.

There may be hundreds of words that have become part of the language in your lifetime. If you went back in time to your childhood, what are some words that wouldn't have been heard then? Write them here.

____

____

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You should have an idea of how much the language has changed in your lifetime. You should also understand some of the reasons why the language changes. There are influences from our own culture and from cultures around the world. You can say that language is like a mirror of culture and time.

Now, let's look at the special language used in the health care field. Think back to when you were a child. Suppose you were to go back in time and talk with people in the health care field. What are some words that are common now but wouldn't have been known back then? Write them here.

A SHORT HISTORY OF THE ENGLISH LANGUAGE

Part One

The English language has been spoken for a long time. It was being spoken in 400 AD! Think about how many changes there must have been in the language since then.

This lesson will tell you about the three main periods in the history of the English language.

1. Old English (Around 400 to 1100 AD)

At the beginning of this period, England was known only as Britain. It was occupied by the Celts, who were the ancestors of the Irish, Scots, and Welsh. Britain was invaded in the 400s by three Germanic tribes—the Angles, Saxons, and Jutes. The influence of these invading tribes marked the beginning of the English language as we know it. In fact, the name England came from one of these tribes, the Angles (*England* = the land of the Angles). The language spoken then was very different from what we speak today. But a few words remain unchanged from that time: **run, man, a, child, the, for**. This sample of Old English is taken from the Anglo-Saxon Gospels, which was written about 995 AD:

> Behealdaþ heofonan fuglas, forðam ðe hig ne sawaþ, ne hig ne ripaþ, ne hig ne gadriaþ on berne; and eower heofonlica fæder hig fet. Hu ne synt ge selran ðonne hig?
>
> (Look at the birds of the air: they neither sow nor reap nor gather into barns, and yet your heavenly Father feeds them. Are you not of more value than they?)

Another major influence during this period was the spread of Christianity, which began around 500 AD. Latin was the language of the Church, and to this day our language contains thousands of words from Latin. Some examples of words that have survived unchanged include: **hymn, priest, bishop, nun, shrine, monk,** and **psalm**.

2. Middle English (1150 to 1500 AD)

There was an enormous French influence on the language of this time. The Normans, who were French, invaded England in 1066 AD. After the invasion, the official language of England was Anglo-Norman French, but it never replaced English. The common people still spoke English. But the French influence was strong. It added nearly ten thousand words to the English language. For example, the English used the names of animals when they talked about meat. We can thank the French for giving us the words **veal** for calf, **beef** for cow, **mutton** for sheep, **venison** for deer, and **pork** for pig.

As the Norman influence began to fade, English was once again the major language. This example of Middle English is taken from *The Canterbury Tales,* by Geoffrey Chaucer. It was written between 1370 and 1399 AD:

> Wel he loved he garleek, oynons, and eek lekes
> And for to drynken strong wyn, reed as blood;
> Thanne wolde he speke and crie as he were wood
> And when that he wel dronken hadde the wyn,
> Than wolde he speke no word but Latyn.

Another important influence was the printing press, which was brought to England in 1476 AD.

3. Modern English (1500 AD to present)

The printing press made reading materials available to more people. At the same time, formal education was available to more people. The teaching of Latin and Greek was important in the schools at that time. Some Latin and Greek words have survived intact: **alibi, bonus, doctor, junior, stimulus** from Latin; and **asbestos, chaos, echo,** and **idea** from Greek.

Two other important influences on the growth of the English language were colonization and the spread of commerce. During their travels for trade and colonization, the English brought back to the vocabulary many new words from around the world. Some examples include:

kindergarten (Germany), **piano, pizza** (Italy), **wigwam** (American), **tank** (Portugal), and **rodeo** (Spain).

Part Two

Let's look at a short history of medical language. You will hear many Latin and Greek words in the health care field.

First, when Rome invaded Greece, it did not have much knowledge about the science of medicine. The Greeks had a long tradition of study and diagnosis of disease. So the Romans took much of this knowledge with them. Many Greek words were reshaped into Latin words.

But why would something that happened so long ago have an influence on medical language today? Sometimes doctors and other health care workers want a "polite" way of discussing a patient's condition without alarming or offending the patient. Medical words with Latin and Greek parts also allow health care workers to be more precise in what they are discussing. For example, compare "dizzy" to the more precise terms of vertigo, disorientation, ataxia, or somnolence.

Many English words are made up of word parts. If you know the meanings of the parts, you can often figure out what the whole word means. This helps build your vocabulary. Using word parts will help you learn medical words. Hundreds of medical words are built from word parts.

First, let's look at some words you already know that are made up of word parts.

telephone, subway, bicycle

Part Three

Now let's look at how the strategy works. Suppose you come across an unfamiliar word in your reading:

Example: Scientists are exploring *geothermal* sources for forms of energy to replace gas, oil, and coal.

You are not sure what the word *geothermal* means, so you:

1. Identify the word parts and think about other words you already know that have these word parts:

geo—geology, geography, geode, geomagnetic
thermal—thermostat, thermometer,
thermal underwear, thermos

2. Identify the meanings of the parts from the familiar words.

geo—earth
thermal—heat

3. Come up with what you think might be the definition.

geothermal—heat from the earth

4. Read the sentence again and ask yourself if the definition makes sense in the sentence.

It is important for you to become comfortable with this strategy. It will be used in all the lessons of the health care vocabulary unit. A word of caution, however: when it is important to be absolutely certain and precise about a definition, always use a glossary or a dictionary.

A Closer Look

Word parts may be at the beginning, middle, or end of a word. This lesson will teach you the names for each type of word part.

1. All words have a main part called the **root**. The root of the word carries the meaning of the word. For example:

What do you think is the **root** of these words?

breaking, breakable, break, unbreakable

Some words have more than one root. They are called **compound words**.

Look at these **compound words**.

breakfast, breakdown

2. Some words have a word part added to the beginning of the word. The group of letters added to the beginning of the word is called the **prefix**. The prefix adds to or changes the meaning of the root.

What do you think is the **prefix** of these words?

unbreakable, unfriendly, mistreat

3. Some words have a word part added to the end of the word. The group of letters added to the end of the word is called the **suffix**. The suffix adds to or changes the meaning of the word and often changes the part of speech of the word.

Look at this group of words. The **suffix** adds to or changes the meaning of the root. It usually changes the part of speech of the root.

act, active, activate, action
operate, operation, operator

4. Sometimes two roots are put together and we have to add a vowel in between them. The vowel that is added to make the two roots "stick" together is called a **combining form**. Look at the word *thermometer*. There are two roots, therm and meter. **O** is a **combining form**. Combining forms are often added because it makes the word easier to pronounce.

Students: Refer to this list every time you begin a new chapter in your student book.

Before Reading:

- Review the strategy in your head.
- Read over the new list of word parts and think about any words you already know that have those parts. If you don't know any, think about what the new word parts might mean.
- Listen as the teacher pronounces the new word parts.
- Ask yourself, "What do I want to learn from this chapter?"

During Reading:

- Write down any confusing words or word parts as you encounter them in your reading.
- Think about and use the strategy as you try to figure out unfamiliar words.
- Think about what you already know that can help you figure out the new information.
- Form a picture in your mind to help you learn and remember the new words and word parts.
- Ask yourself, "Do I understand this chapter? Do I need to go back and review some of the word parts?" If you think you will have trouble remembering any word parts, jot them down on a piece of paper and review them when you are finished reading.

After Reading:

- Review any word parts you jotted down while reading.
- Make word cards (one-half of a 3x5 notecard) with the word part on the front and its meaning on the back.

Lesson One

Activity #1: Compare and Contrast

•Directions. Put a check beside the sentence that uses the new word correctly.

1. The doctor looked in Kelly's throat to check for arthritis.
   Joseph could not move quickly and easily because of his arthritis.

2. Tony put a warm cloth on his neck when he thought he had tonsillitis.
   The doctor said I had tonsillitis after I dropped the brick on my foot.

3. When Hector had gastritis, he had to put his arm in a sling.
   Jen could not eat hot and spicy food because of her gastritis.

Activity #2: Writing Activity

•Directions. Write a sentence for each new word made up of word parts. Leave a blank space where the new word belongs. When you are finished, exchange with a partner and write the missing word in the blank. Then read the sentences aloud to each other.

Lesson Two

Activity #1: Cloze

•Directions. Read the following paragraphs. Fill in the blanks with the right word from the medical words you have learned so far.

1. A team of doctors was working with a seriously ill young boy. The ____________________________ kept records of his heart and his kidneys were monitored closely by the _____________________. The _________________________ analyzed the boy's blood work every day and gave reports to the ________________________ who tried to figure out what disease the young boy had. Together, they hoped they would be able to make the young boy well enough to go home to his family.

2. When Ashley developed a horrible case of poison ivy rash, her mother took her to the best skin doctor in town. Dr. James, the ________________________, gave Ashley some cream because the rash was very itchy. The doctor wrote on the chart that Ashley had a skin inflammation, or _______________. Dr. James also suggested that Ashley see her children's doctor, or ____________________, for her yearly check-up.

Activity #2: Grouping Words

•Directions. Look at the way the following list of words was divided:

dog, yellow, horse, purple, green, pig

dog, horse, pig, yellow, purple, green

Divide the following list of words into two groups of words that have something in common.

dermatologist	arthritis	nephritis
gastritis	pathologist	ophthalmologist

Group One:
____
____
____

Group Two:
____
____
____

What do the words in group one have in common?

What do the words in group two have in common?

Activity #3: Maze

•Directions. Circle the best word to fill in the blank

1. Most women see their (neurologist, oncologist, gynecologist) at least once a year.
2. When John felt a tumor on his neck, he made an appointment with the (ophthalmologist, oncologist, nephrologist).
3. People who drink too much and take illegal drugs could benefit from seeing a (pediatrician, hematologist, psychologist).
4. After her eye exam, Carol thanked the (cardiologist, ophthalmologist, nephrologist).

Activity #4: Use What you Know

•Directions. Use the word parts from the first and second unit to build words that mean.

inflammation of the kidneys

____

inflammation of the skin

____

inflammation of the nerves

____

Activity #5: Design a Business Card

•Directions. Choose one of the words that describes a person who is a specialist (**cardiologist, gynecologist, dermatologist, hematologist, neurologist, pathologist, nephrologist,** etc.). Imagine you work for a printing company and you have been asked to design a business card for that person. Use your name and address as the name of the specialist on the card. Include a picture that would serve as a clue to the profession of the person.

Lesson Three

Activity #1: Compare and Contrast

•Directions. Put a check mark beside the sentence that uses the new word correctly.

1. Carlos had 10 stitches in his abdomen after his appendectomy.
   The pharmacy will give you the appendectomy.

2. The doctor's assistant put the phobia in the file cabinet.
   Mary's mother has a phobia about meeting new people.

3. Sarah's brother was febrile so she put cold cloths on his head.
   Ken watched the febrile work on his patient.

4. The pharmacy requires the doctor's signature on the prescription.
   Rosa took the pharmacy to make her tooth stop hurting.

5. The doctor told Bernie that he needed to have a sonogram.
   If you want to get in touch with someone, try sending a sonogram.

6. Debbie did not notice the abdominal paper in her mailbox.
   Her abdominal region is very sore and tender.

Activity #2: Think Aloud

•Directions. Take your paper from Activity #1 and work with a partner. Read the first sentence aloud. Tell your partner how you would figure out the meaning of "appendectomy" from its word parts and the clues in the sentence. You should take turns with your partner on sentences 2-6.

Activity #3: Use What You Know

•Directions. Use the word parts you learned in lessons one, two and three to build the word that means:

removal of tonsils by surgery ____________________________
abnormal fear of women ________________________________
abnormal fear of the heart _____________________________
instrument for measuring the size of the eye
____

Use the word parts to figure out what these words might mean. Write your answer in the blank.

neuropharmacology

____

psychopharmacology

____

electrocardiogram

____

Lesson Four

Activity #1: Write a Memo

•Directions. You need to write a memo to the LPN who comes on duty after you. You want to tell him that the patient in room 234 will need special care after her operation. Part of the memo has been done for you. First, fill in the top part of the memo. Then fill out the rest of the memo with the correct new words from chapter four.

Memo:
To: Brian Kelly
From: ____________________
Date: ____________________

The patient in room 234, Ellen Fast, had her appendix removed this morning. You will be asked to assist with her ______________. Be sure to wash your hands with _________________________ soap before and after you enter her room. The RN will give most of Ellen's medicine through an ________________ tube inserted in Ellen's vein. But Ellen's 10 p.m. pill is ____________________. That means you must put it under her tongue at 10 p.m.

Activity #2: Write a Memo

•Directions. You need to write a memo to the LPN who comes on duty after you (her name is Carol White). You must give her directions for caring for the patient in room 315, Hillary Jackson. Use the following words in your memo:

arthritis
anti-inflammatory
intramuscular
preoperative

Memo:
To: ________________
From: ________________
Date: ________________

____
____
____
____
____
____

Activity #3: Compare and Contrast

•Directions. Put a check mark beside the sentence that uses the new word correctly.

1. The doctor wanted to take an x-ray of my vertebrae.
   The vertebrae didn't fill out the form.

2. Many people use bifocals to straighten their back.
   Wear your bifocals when you read the newspaper.

3. Intervertebral disks are part of your spine.
   The doctor used the intervertebral disks to measure the wound.

4. We looked through the subabdominal glass.
   Frank had severe subabdominal pain.

5. The audiologist checked Maria's hearing.
   She used an audiologist to measure her heartbeat.

6. After her operation, Kelly received preoperative instructions.
   Follow the doctor's preoperative instructions to make sure you heal properly.

7. The antiarthritis drug eased the pain in John's back.
   The antiarthritis drug eased the pain in John's heart.

8. Antibacterial diseases spread throughout the office.
   Use antibacterial soap before and after you touch the patient.

9. Do not allow the intravenous line to become tangled.
   She placed the intravenous pill under the patient's tongue.

10. She felt better during the postoperative period than she felt during the time before her operation.
    Postoperative care helps you to get ready for your operation.

Lesson Five

This lesson is a review of all the word parts the student has learned in lessons one through four. Review the words and word parts.

Here are some activities to try:

1. Compare your notebook with Mary's notebook. Check to see if you have recorded the new words and word parts correctly.

2. Choose 10 word parts. Brainstorm with your class to see how many words you can think of that are made of word parts. Compose a short story using 10 of the words, leaving blanks where the words belong. Exchange stories with a partner and fill in the blanks.

Lesson Six

Activity #1: Write an Article

•Directions. Imagine you have been asked to write an article for a hospital newsletter. You have been asked to write about an exciting event that took place at the hospital.

Use the following words in your article:

quadruplets multipara postpartum

Activity #2: Work with a Partner

•Directions. You and your partner should have a notebook to write down your answers for this activity. Use the word parts from lesson six: **hemi, lateral, multi, para, plegia, poly, quadr/i, semi, tri, uni.** Brainstorm as many words as you can think of that are made up of those word parts. They don't have to be medical words. When everyone in the class is finished, compare lists and see who thought of the most words.

Activity #3: Maze

•Directions. Circle the best word to fill in the blank

1. The woman was (multipara, unilateral, polyneuritis) and decided not to have any more children.
2. Rosa was in extreme pain because of her (multipara, postpartum, polyneuritis).
3. Many women feel depressed during the (polypathia, postpartum, semicircular) period.
4. A person who is a (quadriplegia, quadrilateral, trilateral) needs a lot of help everyday.
5. The jogger was running in the heat and developed (polyarthritis, hemilingual, thermoplegia).
6. People who suffer from (thermoplegia, gastroplegia, polyphobia) are often too afraid to leave their homes.

Activity #4: Cloze

•Directions. Read the following paragraphs. Fill in the blanks with the correct words from lesson six.

Karen gave birth to ____________________. She and her husband, Tim, were shocked to find out they had four babies! The doctor told them they were expecting twins.

Two weeks after she came home from the hospital, Karen suffered from __________________ depression. It was so exhausting trying to care for four little babies! Luckily, her mother and sister came to stay with them for awhile. They helped Karen and Tim take care of little Joe, Flo, Zoe, and Moe.

•Directions. Read the following paragraphs. Fill in the blanks with the correct words from lessons one through six.

Melanie was very worried about the patient in room 304. She took his temperature with a ________________. It was 105°! She called the RN into the room. The RN suggested they page the ________________________ Martha Quinn, one of the heart specialists in the hospital.

Dr. Quinn examined the patient and said he had ________________________. An inflammation of the heart can be very serious. The RN began giving the patient medicine through an ___________________ in his right arm. Two days later, the patient began to recover. Melanie was proud of the professional way she handled the situation.

Lesson Seven

Activity #1: Sorting

•Directions. Sort the following list of words into four groups. Each word in a group should have a similar word part at the beginning of the word. Write the meaning of the similar word part at the top of the group.

gastroscope
hyperthermia
hypertension
cardiologist

hypodermic
hypothermia
gastrotherapy
hypotension

carditis
cardiograph
hyperdontial
gastroscopy

Group One: ___________________ (meaning of word part)
____
____

Group Two: ___________________ (meaning of word part)
____
____

Group Three: ___________________ (meaning of word part)
____
____

Group Four: ___________________ (meaning of word part)
____
____

Activity #2: Sorting

•Directions. Sort the following list of words into four groups. Each word in a group should have a similar word part at the end of the word. Write the meaning of the similar word part at the top of the group.

hypodontia
dermatotherapy
quadriplegia
carditis
nephritis
cardioplegia
dermatitis
macrodontia
gastroplegia
gastrotherapy
hyperdontia
hydrotherapy

Group One: ____________________ (meaning of word part)
____
____

Group Two: ____________________ (meaning of word part)
____
____

Group Three: ____________________ (meaning of word part)
____
____

Group Four: ____________________ (meaning of word part)
____
____

Activity #3: Compare and Contrast

•Directions. Put a check mark beside the sentence that uses the new word correctly.

1. The physician's assistant used the electrocardiograph.
   The electrocardiograph put the record in the box.

2. Luis had to wear a cast for his hypertension.
   Do not use too much salt if you have hypertension.

3. The cat would not go near the tub; you might say it has hydrophobia.
   The hydrophobia treatment felt good on Steve's back.

4. Susan needed a complete blood transfusion.
   The transfusion kept the needle in the cabinet.

5. We suffered from hyperthermia during the heat wave.
   We applied hot cloths to John's head when he had hyperthermia.

6. The LPN inserted the hypotension in the patient's arm.
   Consuela's hypotension made her feel very tired.

7. The young couple were disappointed when the nurse said it was only a pseudopregnancy.
   The pseudopregnancy scared the young couple. How would they be able to care for so many babies?

8. Hydrotherapy kept the scared young boy out of the water.
   The hydrotherapy treatment eased the soreness in June's muscles.

Activity #4: Report to the RN

•Directions. Imagine you have to give a report to the RN. First, you have to write about what happened to the patient in room 112. Use the following words in your report: **electrocardiograph, hypertension, hypodermic, and intramuscular**. Then, read your report to a partner.

Lesson Eight:

Activity #1: Help Yourself Remember

•Directions. This activity will help you remember the words in lesson eight. First, write the meaning of the word. Use the book if you can't remember the meaning. Second, write about how you will try to remember the meaning. For example, for *dorsal,* you might write something like:

I know that the shark's fin that sticks out of the water is called the dorsal fin. This will help me to remember that dorsal means near or on the back. You might even draw a picture of a shark to help you remember. Whatever works for you!

Or, you might write something like this:

I will use the initials **d** and **p** to help me remember dorsal and posterior mean the same thing. I will use the initials **v** and **a** to help me remember ventral and anterior mean the same thing.

You can use these examples if you like or you can make up your own.

dorsal means ______________________________
How I will remember it:

ventral means ________________________
How I will remember it:

anterior means _______________________
How I will remember it:

posterior means ___________________________
How I will remember it:

cephalic means ______________________
How I will remember it:

caudal means _____________________________
How I will remember it:

medial means _____________________________
How I will remember it:

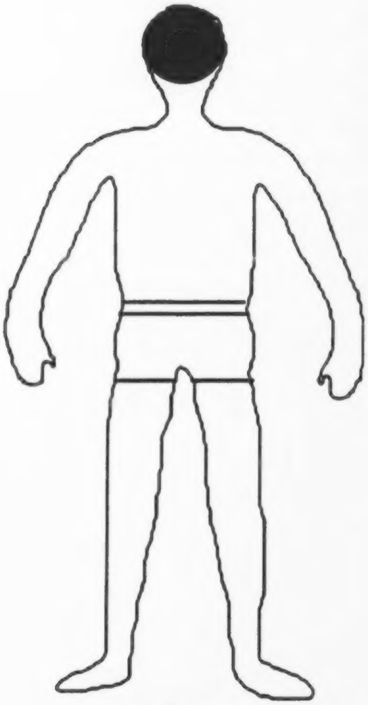
midline means ________________________
How I will remember it:

lateral means ______________________________
How I will remember it:

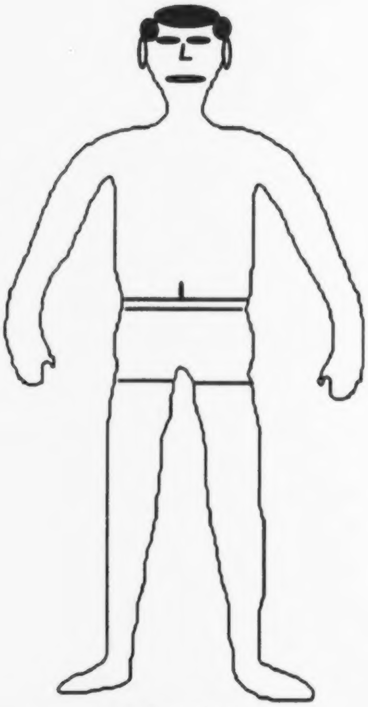
Activity #2: Label the Figures

•Directions. Label each drawing with the correct word. Choose from the following words:

anterior
midline
medial
dorsal
caudal
cephalic
lateral
posterior
ventral



DORSAL
POSTERIOR



VENTRAL
ANTERIOR

Activity #3: Make a Compare and Contrast Exercise

•Directions. In some of the activities, you were asked to choose the sentence that used the new word correctly. For example:

Debbie did not notice the abdominal paper in her mailbox.
Her abdominal region is very sore and tender.

For this activity, you will have to make a similar exercise for your partner. Use the following words **dorsal, posterior, midline, medial, lateral, ventral, anterior, caudal, cephalic**

Remember to make one sentence that uses the word correctly and one that does not, When you are finished, exchange papers with your partner.

Lesson Nine:

Activity #1: Confusing Word Parts
•Directions. This lesson has some word parts that might be confusing. This activity will help you remember them.

1. *esthesi/o* (feeling) and *asthenia* (weakness)

You might remember the word part ***esthesi/o*** means f**ee**ling because the word part and its meaning both have the letter **e** and its sound in them. Say them aloud. You might remember the word part ***asthenia*** means weakness because the word part and its meaning both have the letter **a** in them.

Don't be confused when other word parts are added. For example, when the word part **an** is added to *esthesi/o,* try to remember the meaning of just the word part *esthesi/o* first, and then look at the other word parts.

For example, add the word part that would change the meaning to without feeling:

_______________ esth i/o

Now, add the word part that would make the word mean "a person who specializes in...."

anesthesia ______________________

2. *algesi/o* (pain)

This word part looks similar to asthenia and esthesi/o. One way you might remember *algesi/o is* by thinking of the following: If you have severe pain, you might say something like, "**Gee**, I have a lot of pain." *Algesi/o* has the letter **g** in it.

Activity #2: Compare and Contrast
•Directions. Put a check mark beside the sentence that uses the new word correctly.

1. The analgesic was painful for the nurse.
   The RN gave the patient an analgesic.

2. An inflammation of the meninges can be very serious if it is not treated properly.
   The doctors asked the meninges to fill out the forms.

3. The nurse injected the dye for Sharon's myelogram.
   The myelogram showed that her lungs were clear.

4. The cranium protects the spinal cord.
The cranium protects the brain.

5. She did not feel anything during the operation because she had anesthesia.
His anesthesia made him sneeze in the springtime.

6. Janet was very worried because her son, John, had encephalitis; if the CAT scan of his brain did not show improvement, he would be moved to intensive care.
Encephalitis made Katrina's nose run almost all day; she went through two boxes of tissues.

7. Ken wanted the skilled anesthesiologist to perform the craniectomy.
Ken wanted the skilled neurologist to perform the craniectomy.

8. She was flat on her back because of neuralgia.
Neuralgia made the pain in her back feel better.

Activity #3: Figuring Out New Words

•Directions. Use the words parts you learned in this lesson and some of the ones from the other lessons to figure out the meanings of these words. They may look long and complicated, but they are made up of word parts you have learned!

hyperthermalgesia

____

myeloencephalic

____

neuromyelitis

____

ophthalmalgia

____

anencephalus

____

Lesson Ten

This lesson is a review of all the word parts you have learned in lessons one through nine. Review the words and word parts.

Here are some activities to try:

1. Make up imaginary phobias using word parts from the story. Draw pictures or role play your stories.
2. Role playing is a good way to practice saying new words and word parts aloud. Develop case studies similar to the one you did in lesson seven, Activity #4.
3. Go through your notebook and cover up the word part; read the meaning and try to guess the word part.

Lesson Eleven

Activity #1: Case Study

•Directions. Read the case study. Fill in the blanks with words from lesson ten or words you already learned.

Judy was very unhealthy in the winter of 1992. It all began with a pain in her liver which turned into an inflammation. The doctor diagnosed it as ____________. He prescribed an ____________________ to relieve the pain. He also told her to be extra careful about washing her hands; he said she should always use ____________________ soap.

When that cleared up, Judy lived through one of the most frightening experiences of her life. She found a lump during a self-exam of her breast! She was afraid she would have to have a ____________________. Fortunately, the doctor did some tests and discovered that the lump was not serious.

Activity #2: Sorting

•Directions. Sort the following list of words into three groups. Each word in a group should have at least one word part that is the same. Write the meaning of the similar word part at the top of the group.

cardiopulmonary
pulmonitis
subpulmonary
rhinitis
mastitis
intrahepatic
hepatalgia
microhepatia
hysteritis

Group One: ____________________ (meaning of word part)
____
____

Group Two: ____________________ (meaning of word part)
____
____

Group Three: ____________________ (meaning of word part)
____
____

Make a sorting list for your partner. Choose two words that have similar word parts for each group. Make four groups of words.

Activity #3: Write a Memo

•Directions. You need to write a memo to the LPN who comes on duty after you (his name is Joseph Torelli). You must give him directions for caring for the patient in room 304, Marion Cullen. Use the following words in your memo:

otitis, otologist, rhinalgia, rhinesthesia.

You can also use other health care words if you like.

Memo:
To: ______________
From: ______________
Date: ______________

____
____
____
____
____
____
____
____

Lesson Twelve

Activity #1: Confusing Word Parts

1. *myel/o* (spinal cord) and *my/o* (muscle)

You might remember that *myel/o* has the letter **l** in it that kind of looks like the spinal cord. Or, you can think of a different way to remember the difference between the two word parts. Write about your way below:

____
____
____

Write a sentence using the word *myostitis*. Write another sentence using the word *myelitis*.

____
____
____

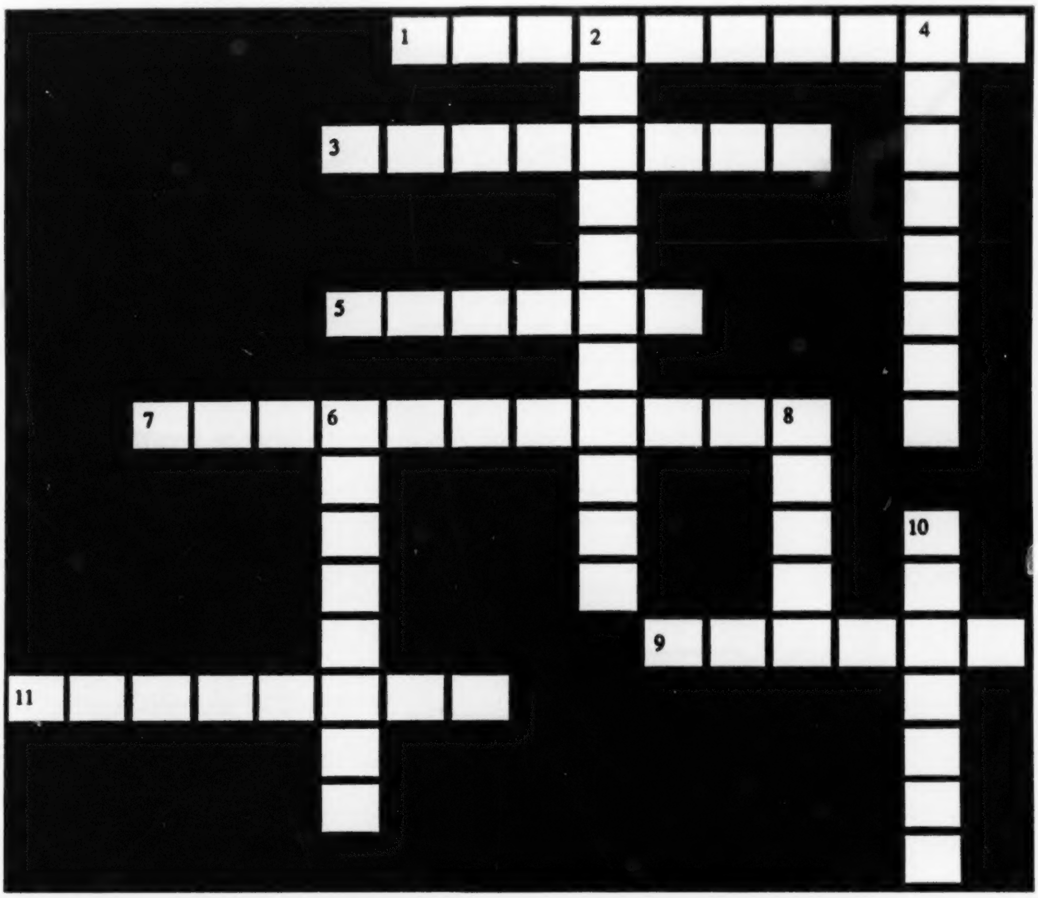
Activity #2: Maze

•Directions. In some exercises you have been asked to choose the correct word to fill in the blank. For example:
After her eye exam, Carol thanked the (cardiologist, ophthalmologist, nephrologist).

For this exercise, you will be asked to make a maze activity for a partner. Make five questions using five new words from lesson 11. You may use any of the words you have learned as possible answers in the activity.

Activity #3: Crossword Puzzle

•Directions. Use the clues to fill in the puzzle.



Across:
1. surgical removal of the sack of fluid between joints
3. substance capable of producing a disease
5. end of spinal column
7. inflammation of middle layer muscle of heart wall
9. vertebrae of lower back
11. group of vertebrae in chest area

Down:
2. inflammation of vertebrae
4. started in the muscle
6. vertebrae in neck
8. contracting or tightening of muscles
10. muscle pain

Lesson Thirteen

Activity #1: Sorting

•Directions. Sort the following list of words into four groups. Each word in a group should have a similar word part. Write the meaning of the similar word part at the top of the group.

costal
rhinoplasty
toxic
cardiomalacia
spondylomalacia
intercostal
plastic surgeon
toxicophobia
toxicologist
myomalacia
costectomy
otoplasty

Group One: ____________________ (meaning of word part)
____
____

Group Two: ____________________ (meaning of word part)
____
____

Group Three: ____________________ (meaning of word part)
____
____

Group Four: ____________________ (meaning of word part)
____
____

Activity #2: Report to the RN

•Directions. Imagine you have to give a report to the RN. First, you have to write about what happened to the patient in room 112. Use the following words in your report: **antitoxin, neonatal, tachycardia**. Then, read your report to a partner.

____
____
____
____
____
____
____
____

Activity #3: Figuring out New Words

•Directions. Use the word parts you learned in this lesson and the other lessons to figure out the meanings of these words. They may look long and complicated but they are only made up of word parts you have learned!

cardiosclerosis ______________________________

gastroplasty ______________________________

meningioma ______________________________

otoplasty ______________________________

podoedema ______________________________

toxicodermatitis ______________________________

vertebrocostal ______________________________

thoracoplasty ______________________________

craniomalacia ______________________________

hepatoma ______________________________

Pre/Post Tests

____
Name

____
Date

Write the word part in the blank that means:

____________________ before

____________________ inflammation

____________________ heat

____________________ many

____________________ three

____________________ half

____________________ uterus

____________________ woman

____________________ ribs

____________________ the mind

Use two word parts to make a word that means:

an expert of the mind

__________ __________

an inflammation of the liver

__________ __________

abnormal fear of being poisoned

__________ __________

multiple births

__________ __________

water treatment

__________ __________

removal of all or part of the stomach

__________ __________

Use word parts to help you understand the meaning of these words. Write the meaning in the blank.

cardiogram

rhinoplasty

encephalomyelitis

nephralgia

hypothermia

quadriplegia

cardiohepatic

Match the word parts to their meanings (not all meanings will be used):

_______ vertebr/o

_______ pseud/o

_______ crani/o

_______ esthesia

_______ schlerosis

_______ pulmon/o

A. skull

B. bile

C. feeling, sensation

D. backbone

E. slow

F. false

G. hardening

H. lung

Answer the following questions:

The doctor prescribed an **analgesic**. What will that do?

____

____

The woman had **edema**. What does that mean?

____

____

The test showed that he had **hyper**thyroidism. Did his thyroid produce too much or too little?

____

____

After exercising, he suffered from back **spasms**. What was happening to his back?

____

____

Here are some word parts that show direction or location. Match the right direction or location with the word parts. Some meanings might match more than one word part. Not all meanings will be used.

_______ medial

_______ trans

_______ posterior

_______ dorsal

_______ inferior

A. below

B. on the left side of the body

C. beside

D. in the middle

E. back of the body

F. across or over

Use the word parts in the box to match the definitions. Write the correct word part in the blank. Not all word parts will be used.

dactyl/o
encephal/o
brady
lingual
hydr/o/a
my/o
mening/o
oma
febr/o
abdomin/o
tachy
cost/o

____________________ fast

____________________ rib

____________________ muscle

____________________ slow

____________________ brain

____________________ fever

____________________ finger or toe